Folk Psychology
and
Cognitive Science

by

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> In a chess game if a computer were to interpose a piece between your Queen and its King, it would be perfectly reasonable and certainly no deviant use of English to say the computer believes it is in check and desires to prevent a mate. We ascribe beliefs and desires to each other in the same way so as to be able to cooperate with, take advantage of, or overcome one another. (Nelson, 1988, p.145)

Cognitive Science, which emerged as a study in its own right in the 1970s, is best understood as an investigation of mental life and cognition**(1)** which "makes it possible to study phenomena that emerge from the individual by providing methods for investigating the content of the individual's mind and mental life" (Anderson, 2001, p.13), and is conducted within a wide range of participating domains (see **Fig.1**).

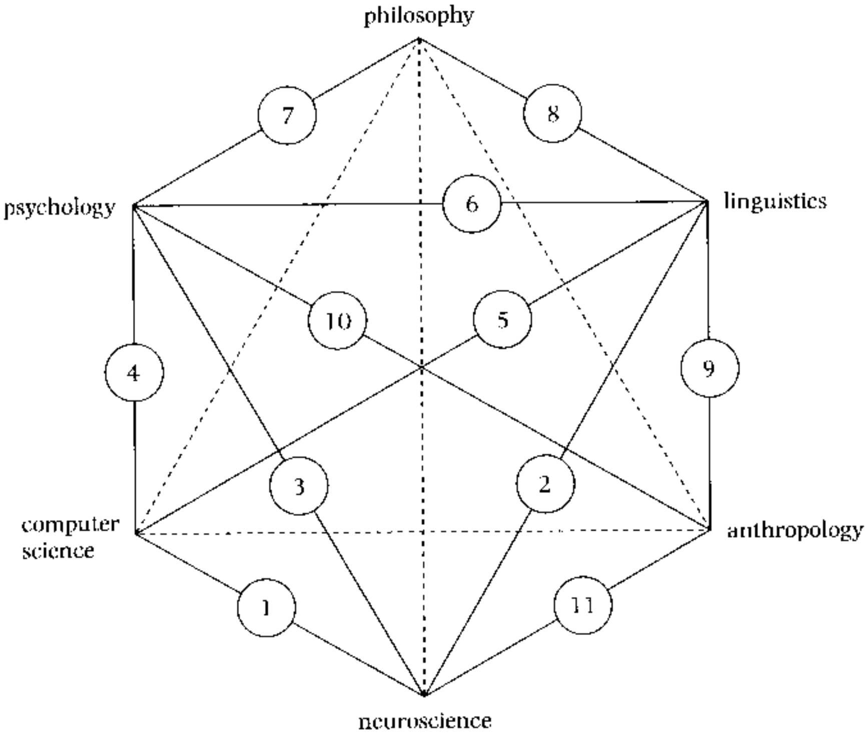

Fig.1: **Conventional representation of the domains and sub-domains of cognitive science according to the 1978 Sloan Report on Cognitive Science**: The six domains (philosophy, linguistics, anthropology, neuroscience, computer science and psychology) are each represented by a node. The labelled connexions between nodes represent the sub-domains of: (1) cybernetics, (2) neurolinguistics, (3) neuropsychology, (4) simulation of cognitive processes, (5) computational linguistics, (6) psycholinguistics, (7) philosophy of psychology, (8) philosophy of language, (9) anthropological linguistics, (10) cognitive anthropology, (11) evolution of the brain. The dotted lines represent other potential sub-domains that were undeveloped in 1978) sub-domains. Adapted from Bechtel, *et al.* (1999, p.70).

Because each of Cognitive Science's contributing domains has its own preferred model(s) of representation, technical terminology, set of tools, systematic method(s) of investigation, and idiosyncratic goals, these interdisciplinary projects amongst the various cognitive sciences promise to provide a massive increase in knowledge about cognition (and its associated activities and processes).**(2)**

Folk Psychology

Folk Psychology (also known as "belief-desire psychology" or "commonsense psychology")**(3)** is the name Cognitive Scientists give to the "widely assumed… body of implicit general knowledge of theory [of]… the basic internal organization of the system that controls human behaviour",**(4)** which is assumed to be "the source of everyday human competence in predicting and explaining human behavior, including the capacity to ascribe mental states" (Gordon, 1999, p.265).**(5)**

Churchland (1991,p.59) argues that this "understanding of others" is not limited by one's own experience and is far more than just an "extrapolation from one's own case".**(6)**

Bennett (1991, p.176) calls the process through which "a thinking system *does* what it *thinks* will bring about what it *wants*" the "belief-desire-behavior triangle".**(7)**

Confusing alternative uses of the term "Folk Psychology"

The term folk psychology has been used to denote many different things.

Straub, the ("authorized") translator of Wilhelm Wundt's highly influential book (Wundt, 1916), chose "folk psychology" for the term *Völkerpsychologie* despite the fact that Wundt's text strongly indicates he was speaking of 'ethnopsychology'.**(8)**

Contemporary psychologists often use the term "folk psychology" pejoratively when referring to folk wisdom, precepts, proverbs, etc., asking "If many hands make light work, why do too many cooks spoil the broth?", etc.**(9)**

Use of belief-desire psychology is embedded in our culture

It is a legal principle that the commission of a socially harmful act is only a crime when two components coexist (Kaplan and Sadock, 1998, pp.1314-1317): voluntary conduct (*actus reus*) and evil intent (*mens rea*).**(10)** In the absence of evil intent no crime has occurred. And, as commonsense indicates, an unintentional act is not a criminal act.**(11)**

The concept of psychosomatic disease is predicated upon this understanding; and, except for a minority of behavioural therapists, psychotherapists operate from an overall notion that behaviour can be driven by erroneous beliefs.**(12)**

The most effective system, generically known as "cognitive therapy",**(13)** was independently developed by therapists who rejected the 'invasion by demons'/'prisoner of the past' view of Freud's psychotherapy and, instead, held Epictetus' view that events themselves did not harm people, but their reactions did.**(14)** Their therapies followed the direction of Adler, rather than Freud, and concentrating on the future, took the view that an individual's actions were always 100% appropriate, *if the real world actually was the way that individual imagined it to be*.**(15)**

Other associated areas include Heider's (1958) work on the extent to which perceptions of causality affect social behaviour (and how, rather than responding to stimuli, we respond to what we think caused them) generally known as "attribution theory", Rotter's (1966) work on the attribution of "internal" versus "external" locus of control as a key personality trait, Festinger's work (Festinger, et al., 1956; Festinger, 1957; Festinger & Carlsmith, 1959; Festinger, 1964; and Stone, 2000) on "cognitive dissonance",**(16)** and Seligman's work on "learned helplessness".**(17)**

Views that are to some degree consistent with "Other Minds"

For social philosopher, George Mead (1934, pp.144-164), the main difference between just *playing* (e.g., pretending to be a policeman) and taking part in a *game* (e.g., baseball) is that a game requires the child to be able to take the rôle of another:

> The fundamental difference between the game and play is that in the latter the child must have the attitude of all the others involved in the game…
>
> Each one of his own acts is determined by his assumption of the action of the others who are playing the game. (pp.153-154)**(18)**

These ideas are consistent with the (subsequent) ideas of Piaget on the child's gradual development of cooperation and its understanding of the intentions of others.**(19)**

Since Descartes introduced "methodic doubt" into philosophy, philosophers have discussed *solipsism*,**(20)** the view that the self is all that can be known to exist; a view that was described by Bertrand Russell as being "hard to refute, but still harder to believe".**(21)** This question, in turn, raised the epistemological issue of "other minds" (Nagel, 1974; Jackson, 1986; Bilgrami, 1993; and Dretske, 1995, etc.):

> …whether — and, if so, how — one can know, or be justified in believing, that other individuals (humans and animals) have thoughts and feelings… [And], even if it is obvious that other creatures have a mental life, is there any basis for thinking that, from the subjective standpoint, it resembles ours? (Dretske, 1995, p.637)

"Folk Psychology" and "Theory of Mind"

The term "theory of mind" was introduced in Premack and Woodruff's (1978) landmark paper "Does the chimpanzee have a theory of mind?",**(22)** which defined a "*theory of mind*" as follows:

> An individual has a theory of mind if he imputes mental states to himself and others. A system of inferences of this kind is properly viewed as a theory because such states are not directly observable, and the system can be used to make predictions about the behavior of others. As to the mental states the chimpanzees may infer, consider those inferred by our own species, for example, *purpose* or *intention*, as well as *knowledge*, *belief*, *thinking*, *doubt*, *guessing*, *pretending*, *liking*, and so forth. (p.515)

This paper had a very significant influence on cognitive scientists, primatologists and developmental psychologists. The ensuing work of Wimmer and Perner (1983) in the domain of developmental psychology was such that the term "theory of mind" soon became the preferred term of psychologists.**(23)**

According to Gordon (1999), the terms *Folk Psychology* and *Theory of Mind* are essentially synonymous; with philosophers tending to speak of *Folk Psychology*, and psychologists *Theory of Mind*.**(24)**

Mentalizing (or "Mind-Reading")

Frith and Frith (1999) gave the name "*mentalizing*" to the "capacity to understand and manipulate the mental states of other people and thereby alter their behavior"; which, they say, "reaches beyond the ability to manipulate the behavior of others by direct instrumental action". Others have given this capacity the equally useful name "*mind-reading*".**(25)**

Mentalizing is the ability that underlies the "awareness [in us] that other people have beliefs and desires different from our own, and that their behavior can be explained by these beliefs and desires".**(26)**

Not only is it true that "mental state attribution play[s] a major role in all social interactions and form[s] the basis of daily gossip, as well as novels and plays",**(27)** but Frith and Frith also argue that this capacity to "mentalize" is an essential aspect of what they term "*social intelligence*"; which includes: (a) an ability to recognize a member of the same species; (b) an ability to know one's place in society; (c) an ability to learn from others; and (d) an ability to teach novel skills to others.

Three "waves" in the study of cognitive development

According to Flavell (2000) the study of cognitive development has had three entirely different, separate "waves" of theory and research over the last century:

(1) *Social-Cognitive Development* (1930s), based on Piaget's theories, studied:

> …perceptual perspective-taking; egocentric communication; the misattribution of mental characteristics to physical objects (animism) and physical characteristics to mental events (realism); and understanding of thoughts, dreams, intentions, and morality. (Flavell, 2000, p.16)

(2) *The Meta-Cognitive Wave* (1970s).

Metacognition (lit., "cognition about cognition"), is defined as:

> …any knowledge or cognitive activity that takes as its cognitive object, or that regulates, any aspect of cognitive activity[. It is] a broad concept that encompasses people's knowledge about the nature of people as cognizers, about the nature of different cognitive tasks, and about possible strategies for coping with different tasks. It also includes executive skills for monitoring and regulating one's own cognitive activities…" (Flavell, *op.cit.*)**(28)**

(3) *The Theory of Mind Wave* (1980s to present).

The differences between Theory of Mind and Metacognition Studies

According to Flavell (2000, p.17), although "both traditions share the same overall objective, that is, to instigate the development of children's knowledge and cognition about mental phenomena", the research literature has become "surprisingly distinct and unconnected", and this has occurred most likely "because the two traditions have tended to focus on different developments within the broad cognition-about-cognition umbrella".

TABLE ONE makes some clear distinctions between "*theory of mind*" (**ToM**) studies and "*metacognitive development*" (**MC**) studies:

TABLE ONE: Comparison between Theory of Mind and Metacognition Studies

THEORY of MIND STUDIES (**ToM**)	METACOGNITION STUDIES (**MC**)
ToM concerns itself with studying the “the ability to impute mental states to others, and therefore, to appreciate what other people want, know or feel”. **(G)**	**MC** concerns itself with studying “executive function”, the “set of cognitive abilities necessary to maintain and appropriate problem-solving set for attainment of a future goal”, which includes “set-shifting, set maintenance, inhibition, planning and working memory”. **(G)**
ToM investigates “the origins and earliest expressions of knowledge about the most elementary types of mental states (desires, beliefs, etc.)”. Because of this, **ToM** has predominantly dealt with infants and young children. **(F)**	**MC** investigates knowledge and skills (implicitly presupposing “the prior acquisition of some understanding of these states”). “One cannot test for a child's understanding of memory strategies (metacognition) if the child is too young even to know what remembering something means (theory-of mind).” Because of this, **MC** has predominantly dealt with older children and adolescents. **(F)**
ToM research investigates “children's initial knowledge about our most basic mental states — desires, percepts, beliefs, knowledge, thoughts, intentions, feelings, and so on” and attempts “to determine what children of different ages know about the existence and behaviour of these various states, and also what they know about how mental states are causally linked to perceptual inputs, to behaviour, and to other mental states.” **(F)**	**MC** research is far more problem-centred and goal-oriented (“one could think of it as a kind of "applied theory-of-mind"”), investigating “task-related mental activities” such as “what one should do with one's mind in trying to solve some problem or task” (including strategies for making “cognitive progress” on things such as “memory or comprehension tasks”). **(F)**
ToM is concerned with the “second-order” issues relating to “the subject's understanding of some other person's mind, or of minds in general”. **(F)**	**MC** is concerned with the “first-order” issues relating to “what the subject knows about how to use his/her mind rather than someone else's”. **(F)**
With the **ToM** “false belief task”(a) the focus is on what the subject feels that “a naive other child would think is in the cookies box”. **(F)**	With **MC**, whilst the question “how often other people or people in general use their minds in task situations” may provide useful “models for how the subject should use his/hers, but it is the subject's own use or non-use that is usually of primary interest”. **(F)**
There is almost no research on adult **ToM**. **(F)**	“There is currently a fair amount of psychological research being done with adults under the rubric “metacognition” — on feelings of knowing, for example…” **(F)**

Notes

Quotes from taken from Flavell (2000) are marked with **(F)**; and those from Garner, et al. (1999) with **(G).**

(**a**) Flavell (2000, p.15) describes the cookie box “false belief task” as follows:

“[The experimenter] shows a 5-year-old a cookies box with a picture of cookies on it and asks her what is in it. "Cookies", is the ready answer. The child then looks inside the box and to her surprise sees that it actually contains crayons, not cookies. "What would another child who had not yet opened the box think was in it?" the experimenter now asks. "Cookies!" says the child, amused at the trick. The experimenter then tries the same procedure with a 3-year-old. The answer to the first question is the expected "cookies", but the response to the second is: unexpected "crayons". Even more surprising, the child also maintains that he himself had initially thought that the box would contain crayons. Unlike the 5-year-old, the 3-year old shows no evidence of understanding that either he or other people could hold a belief that is false.

This task is based on the view that a “false belief” test (viz., testing the ability of **X** to recognize that **Y** holds a *false* belief) provides very persuasive evidence of **X** having a concept of “*belief*” — i.e., when compared with a “true belief” test (viz. testing the ability of **X** to recognize that **Y** holds a true belief) — “because [subjects] could be correct on true-belief tasks by egocentrically assuming that others know what they themselves know” and, as a consequence, may well be doing nothing more than “just reporting the true state of affairs” (Flavell, 2000). Frith and Frith (1999), remarking that “false beliefs can be removed by education and implanted by deception”, explain it this way: “The acid test of mentalizing is the ability to compute what another person will do on the basis of a false belief. To predict what a person will do on the basis of a true belief is not a sufficiently stringent test, since here the belief coincides with reality, and it is hard to tell whether the action is governed by physical reality or mental state.”

Recognizing “False Beliefs”

In their 1978 paper, “Does the chimpanzee have a theory of mind?”, Premack and Woodruff argued from their experience of primates that chimpanzees *could* “mentalize” (viz., that they, did, in fact have a “theory of mind”), based on their observations that the primates acted as if they were attributing sequences of thoughts to other primates; and, then, behaved towards those others in a fashion that was consistent with those thoughts actually existing.

In separate critiques, whilst not disputing the notion that chimpanzees had a "theory of mind", Bennett (1978), Dennett (1978a), and Harman (1978) each argued that the data presented did not support Premack and Woodruff's conclusions. Based on Lewis' work (1969) on the "coordination problem" — viz., "situations in which, relative to *some* classification of actions, the agents [involved] have a common interest in all doing the same one of several alternative actions" (p.24) — which centred on the expectation of another's conduct (e.g., for two to meet, each must each expect the other to be in a certain place and, as well, each act on that expectation),**(29)** each of the three independently suggested that the question of whether a chimpanzee animal possessed the concept of belief might be settled in something like the following fashion:

(a) primate A and primate B are in the same room and both see the keeper put object X under box ONE;

(b) B leaves the scene, and, whilst B is still absent, the keeper re-enters the room;

(c) In full sight of A, the keeper moves X from under box ONE to under box TWO;

(d) B returns.

Does A expect B to reach into container ONE or container TWO?

If A understands that another can *hold*, and *act on*, a *belief* that is *factually untrue*, it will expect B to look in container ONE. If A does not understand that another can hold a belief that is factually untrue, it will expect B to look in container TWO.

By the late 1970s, Bretherton and her colleagues (Bretherton, McNew & Beeghly-Smith, 1981) were investigating whether infants had a "*theory of mind*" (as defined by Premack and Woodruff); and in the early 1980s Wimmer and Perner (1983) were using the method outlined above "to test young children's understanding of false belief". Gradually, over time, the test evolved into Frith's Sally-Anne task (Fig. 2, below).

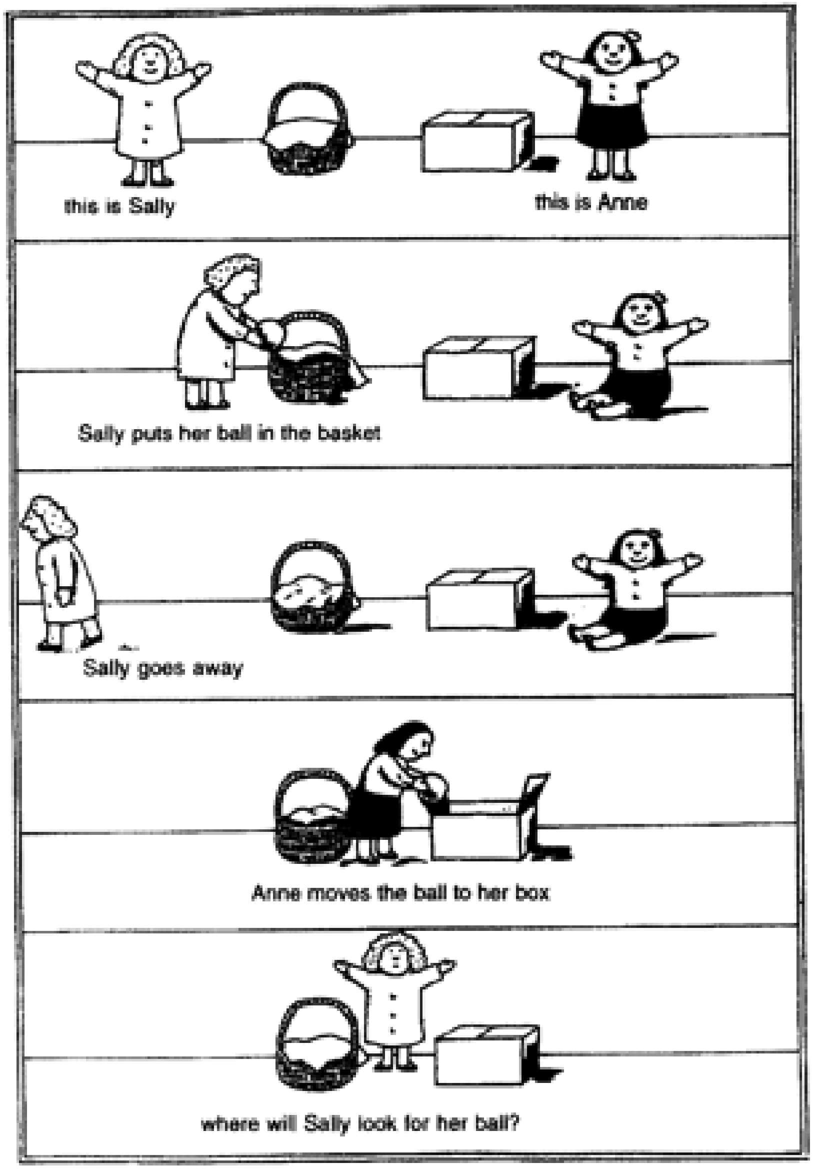
this is Sally
this is Anne
Sally puts her ball in the basket
Sally goes away
Anne moves the ball to her box
where will Sally look for her ball?

Fig. 2: ***Frith's "Sally-Anne" Task:*** *"The child is shown the scenario illustrated, which can be enacted by puppets or real people. At the end the child is asked "where will Sally look for her ball?" To answer this question the child must realize that Sally has not seen the ball being moved and, therefore, that Sally falsely believes that the ball is still in the basket."* (Frith & Frith, 1999, p.1692)

Developing the capacity to "read" minds

Children seem to be specifically programmed to learn how to 'read' minds;**(30)** and, as they develop, children *gradually* evolve the capacity to "work out what people might know, think and believe" based on what those people say or do:

> By the end of the first year of life, normal infants… can tell that they and someone else are attending to the same thing, and can read people's actions as directed at goals and as driven by desires. As toddlers, they can pretend and understand pretense. And by the time they begin school, around 4, they can work out what people might know, think and believe. (Baron-Cohen, 1995, pp.59-60)**(31)**

Whilst much is made of the human ability to 'read' the mind of others, the 'common-sense' attributions that are routinely make, and the fixed views that these assumptions inevitably create, may well obscure the 'real truth' in particular cases.**(32)**

The human "mind-reading" system

Partly based on the pattern of his observations of those with mental process or sensory deficits, like autism and blindness, Baron-Cohen [1995] suggested that the (normal) human mindreading system was comprised of four mental modules:

(a) an intentionality detector (**ID**),
(b) an eye direction detector (**EDD**),
(c) a shared-attention mechanism (**SAM**), and
(d) a theory-of-mind mechanism (**TOMM**).**(33)**

The incapacity to "read" minds as a defining feature of autism

McCabe and his co-workers (McCabe, *et al.*, 2000, p.4406) found significant differences between the "human mindreading system deficits" of those with blindness and those with autism.**(34)**

Whilst finding that (otherwise normal) blind children only lacked **EDD**,**(35)** and finding that the autistic children had their **ID** and **EDD** capabilities intact, McCabe and his co-workers also found that all the autistic children displayed one of two kinds of impairment; viz., either:

(a) an absence of both **SAM** and **TOMM**, or
(b) an absence of **TOMM** alone.

And, from the fact that all of the autistic children were "unable to understand pretense and [could] not understand that someone might hold a false belief" it is obvious that the lack of ***TOMM*** was a defining feature of autism.

Although it is certainly not a recent phenomenon (Happé, 2001), autism was first described by Leo Kanner, of the John Hopkins Children's Psychiatric Clinic, as recently as 1943, in his paper "*Autistic Disturbances of Affective Contact*".**(36)**

Despite the very close superficial similarity of the two conditions, a simple test can distinguish between autism and schizophrenia. When given a diagram of a boy's face surrounded by four different sweets and asked to determine which sweet the boy wants, those with schizophrenia identify the POLO bar, those with autism have no idea at all (because they are totally unable to infer mental states from gaze direction).

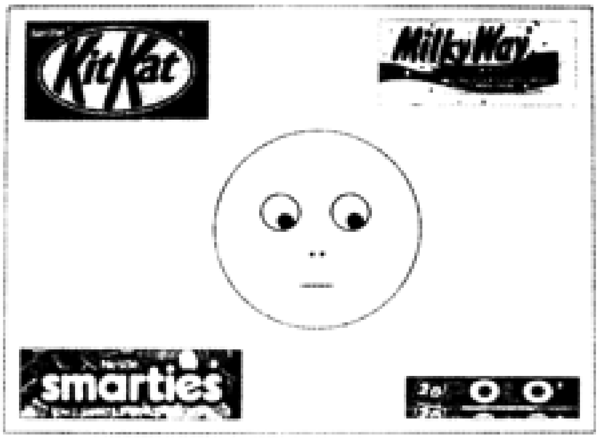

Fig.3: One of Baron-Cohen's Tasks. Shown a diagram of this face and Polo Bar, a Kit Kat Bar, a Milky Way Bar and a packet of Smarties, autistic children can not answer the simple question "*Which sweets does he want?*" (Bruce & Young, 1998, p.213)

Whilst it's quite certain that all of those with autism display **TOMM** deficits, it has not yet been clearly established whether that **TOMM** deficit is a 'cause' or an 'effect'.**(37)**

Dennett's three "stances"

In the late 1970s Daniel Dennett suggested that the behaviour of complex systems could be understood, explained and/or predicted through the adoption of three entirely different "*stances*" (or 'intellectual strategies'): the *physical stance*; the *design stance*; and the *intentional stance*.

The *physical stance* makes predictions from knowledge of the physical constitution of the system and the physical laws that govern its operation; and thus, given a particular set of physical laws and initial conditions, and a particular configuration, a specific future state is predicted. This could also be called the "*structure stance*".**(38)**

The *design stance* requires no knowledge of the physical constitution or the physical laws that govern a system's operation. Based on an implicit assumption that there is no malfunction in the system, predictions are made from knowledge of the purpose of the system's design.**(39)** This could also be called the "*teleological stance*".

The *intentional stance*, "which [clarifies] the logic of mentalistic explanations of behaviour, their predictive power, and their relation to other forms of explanation" (Bolton & Hill, 1996, p.24), requires no knowledge of either structure or design.**(40)**

Predictions are made on the basis of *explanations* expressed in terms of meaningful mental states; and, given the task of predicting or explaining the behaviour of a specific agent (a person, animal, corporation, artifact, nation, etc.), it is implicitly assumed that the agent will always *act* on the basis of its *beliefs* and *desires* in order to get precisely what it *wants*.**(41)** This could also be called the "*folk psychology stance*".

Dennett also postulates (1971/1978b, p.240) that, whilst "the intentional stance *presupposes* neither lower stance", there may well be a fourth, higher level, "truly moral stance toward the system" — the "*personal stance*" — which not only "presupposes the intentional stance" (viz., treats the system as rational) but also "views it as a person".

The Intentional Stance

Dennett (1971/1978a, p.3) took the concept of "intentionality"**(42)** from the work of the German philosopher Franz Brentano (1838-1917).

When clarifying the distinction between mental phenomena (viz., mental activity) and physical phenomena, Brentano (1924/1973, p.97) argued that, in contrast with physical phenomena,**(43)** the "distinguishing characteristic of all mental phenomena"**(44)** was "the reference to something as an object" — a characteristic he called "*intentional inexistence*".**(45)**

Searle (1999a, pp.85) stresses that "competence" in predicting/explaining human behaviour involves being able to both recognize others as "*intentional*" beings, and interpret others' minds as having "*intentional states*" (e.g., beliefs and desires):

> The primary evolutionary role of the mind is to relate us in certain ways to the environment, and especially to other people. My subjective states relate me to the rest of the world, and the general name of that relationship is "intentionality." These subjective states include beliefs and desires, intentions and perceptions, as well as loves and hates, fears and hopes. "Intentionality," to repeat, is the general term for all the various forms by which the mind can be directed at, or be about, or of, objects and states of affairs in the world. (Searle, 1999a, pp.85)**(46)**

Folk psychology provides a systematic, "reason-giving explanation"**(47)** for a particular action, and an account of the historical origins of that action, based on deeply embedded assumptions (Dennett, 1987, p.48-49) about the agent; namely that: (a) the agent's action was entirely rational;**(48)** (b) the agent's action was entirely reasonable (in the prevailing circumstances); (c) the agent held certain *beliefs*;**(49)** (d) the agent *desired* certain things; and (e) the agent's future action *could be systematically predicted* from the *beliefs* and *desires* so ascribed. This approach is also consistent with the earlier work of Heider and Simmel (1944).

Dennett (1987, p.52) argues that, based on our fixed personal views of what all humans ought to believe, desire and do, we predict (or explain) the beliefs, desires and actions of others "by calculating in a normative system";**(50)** and, driven by the reasonable assumption that all humans are rational beings — who do *have* specific beliefs and desires and do *act* on the basis of those beliefs and desires in order to *get* what they want — these predictions/explanations are based on four simple rules (p.49):

(1) the agent's *beliefs* are those a rational individual ought to have (i.e., given his "perceptual capacities", "epistemic needs" and "biography");**(51)**

(2) in general, these *beliefs* "are both true and relevant to [his] life";**(52)**

(3) the agent's *desires* are those a rational individual ought to have (i.e., given his "biological needs", and "the most practicable means of satisfying them") in order to further his "survival" and "procreation" needs;**(53)** and

(4) the agent's *behaviour* will be comprised of those acts a rational individual holding those *beliefs* (and having those *desires*) ought to perform.

Variants of Dennett's three stances

The notion of a three level system was widespread in the late70s/early 80s. For example, when discussing the mental representation of information from a cognitive psychology point of view, Glass and his colleagues (1979, p.24) distinguished three important aspects of representation:

(a) the *content* ("what is being represented");

(b) the *code* ("the format of the representation");**(54)** and

(c) the *medium* ("the physical realization of the code").**(55)**

Others advocating a three level system were Newell, Pylyshyn and Marr; the parallels to Dennett's three stances are detailed in TABLE TWO (below).

TABLE TWO: Variants of Dennett’s Three “Stances”

DENNETT “Stances”	NEWELL Levels of Description	PYLYSHYN Levels of Organization	MARR(a) Levels of Analysis
• *Intentional Stance* “Note that the intentional stance presupposes *neither* lower stance” (1971/1978b, p.240)	• *Knowledge Level* “The system at the knowledge level is the *agent*. The components at the knowledge level are *goals*, *actions*, and *bodies*. Thus, an agent is composed of a set of actions, a set of goals and a body. The medium at the knowledge level is *knowledge* (as might be suspected). Thus, the agent processes its knowledge to determine the actions to take. Finally, the behavior law is the *principle of rationality*: Actions are selected to attain the agent's goals. To treat a system at the knowledge level is to treat it as having some knowledge and some goals, and believing it will do whatever is within its power to attain its goals, in so far as its knowledge indicates.” (p.98)	• *Semantic(b) or Knowledge Level* “[Explains] why people, or appropriately programmed computers, do certain things by saying what they know and what their goals are and by showing that these are connected in certain meaningful or even rational ways.” (p.57) “We need the knowledge level to explain why certain goals and beliefs tend to lead to certain behaviors, and why the behaviors can be changed in rational ways when new beliefs are added by telling things.” (p.60)	• *Computational Theory Level* Specifies “*what* the device does and *why*” (p.22). “What is the goal of the computation, why is it appropriate, and what is the logic of the strategy by which it can be carried out?” (p.25)
• *Design Stance* *N.B.* Dennett (1975/1978) clearly states that he is agnostic about “*Brain Writing*”.	• *Program Level or Symbol Level* Essentially the same as Pylyshyn.	• *Symbol Level* “The semantic content of knowledge and goals is assumed to be encoded by symbolic expressions.” (p.57) “We need the symbol level to explain such things as why some tasks take longer or result in more errors than other tasks.” (p.60)(c)	• *Representation and Algorithm Level* Specifies *how* the device does what it does (p.23). “How can this computational theory be implemented? In particular, what is the representation for the input and output, and what is the algorithm for the transformation?” (p.25)
• *Physical(d) Stance*	• *Physical(d) Level or Device Level* Essentially the same as Pylyshyn.	• *Physical(d) Level or Biological Level* “*The structure and the principles by which the physical object functions correspond to the physical or the biological level.*” (p.57) “*We obviously need the biological level to explain such things as the effects of drugs or jet lag or brain damage on behavior.*” (p.61)	• *Hardware Implementation Level* Specifies the algorithm’s physical substrates (p.24). “*How can the representation and algorithm be realized physically?*” (p.25)

NOTES

(**a**) Based on Newell (1982), Pylyshyn (1989), Marr (1982) respectively. Newell acknowledges that he was aware of Dennett’s views prior to the (1980) address that was published in full 1982: “Before I finished preparing that address I found and read *Brainstorms*. It was instantly clear to me that the knowledge level and the intentional stance are fundamentally the same, and I indicated as much in the talk.” (Newell, 1988, p.521) The four authors all assume that computers and human minds display each of the three distinct levels.

(**b**) Pylyshyn (1989), p.86: “Although the cognitive science community tends to use the term knowledge quite freely in discussing semantic level principles, it is sometimes worth distinguishing those semantic entities that are knowledge from those that are goals, percepts, plans, and so on. The more general term semantic level is used in contexts where such distinctions are important. Philosophers even talk about the “intentional” level or “intentional” objects, but because the use of that terminology tends to raise a large, ancient, and not entirely relevant set of issues, we [viz., Pylyshyn and Newell] shun that term here.”

(**c**) Pylyshyn, 1989, p.61: “Information processing psychology is full of examples of discovering that the form of the representation makes a difference to their [sic] behavior in experiments. For example, in problem-solving experiments it makes a difference whether subjects encode the fact that all the objects in a box are red or the equivalent fact that none of the objects is blue.”

(**d**) N.B.: “*Physical*” means “relating to physics” (as in “*physical laws*”); with the very strong implication that we are speaking of “*hard science*”.

Folk psychology as a way of thinking about things

Dennett is an *instrumentalist*;**(56)** and his *intentional stance* is simply a way of thinking about things. It is significant that, whilst constantly emphasizing that his *intellectual notion* is *indispensable* for any *practical* purpose, he never takes the further step of attributing actual beliefs and desires to any agent. Others have taken different positions (**Fig.4**) in answer to Dennett's question in relation to what he terms "*the illusion of realism*":**(57)** "When are the elements of a pattern real and not merely apparent?" (1991/1998, p.98)

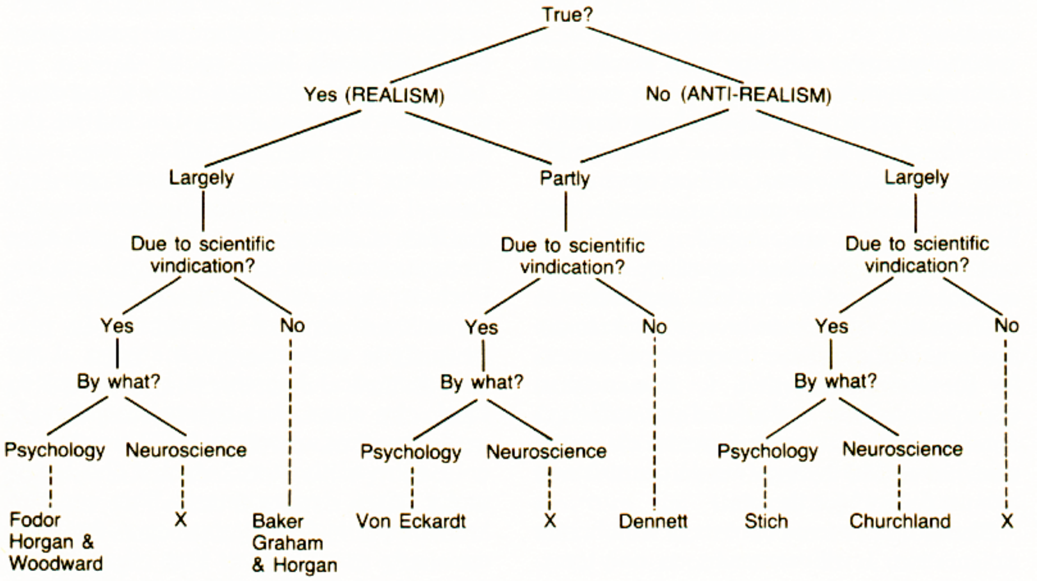

Fig.4: **A taxonomy of various scholars' ontological positions about the "truth" of folk psychology** (Von Eckardt, 1995, p.304)

As a way of thinking about things, Dennett's intentional stance is entirely consistent with everyday commonsense understanding; and, thus, it meets Rosch's (1978, p.28) criterion of the "maximum information with the least cognitive effort".**(58)**

Dennett and "Belief"

Dennett (1978b, 1991) clarifies his use of "*belief*" by distinguishing between "*belief*" and "*opinion*" in this way: (a) "animals may have *beliefs* about this and that, but they don't have *opinions*" (1978b, p.304), and (b) "[opinions] are not just beliefs; [they] are linguistically inflected states [which] only language users have" (1991, p.143) — or, as Dahlbom (1999, pp.162) would have it, "beliefs" are "dispositions to behave" and that "opinions" are "sentences held true".**(59)**

Dennett (1978b, p.307-308) also claims that his distinction explains self-deception and *akrasia***(60)** (states to which, he says, animals are "immune"): circumstances where one behaves according to one's "*beliefs*", but against one's "*opinions*". For example, says Dennett, when "one's deeper behavior-disposing states" ("one's beliefs") drives one to continue smoking, despite one knowing just how lethal smoking is, to Dennett it is a case of having an "*opinion*", but not "*believing*" it.**(61)**

Not all incorrect attributions are harmful

Although the literature is replete with cases of dangerous false beliefs,**(62)** Dennett (p.51) reminds us that a *false belief* caused by "erring on the side of prudence", such as over-estimating the relative strength of a potential antagonist, is generally not such a bad thing "because it 'costs less' in discrimination tasks and protects against random perturbations such as bad days and lucky blows".

"Self-Willed Death"

There is an extensive literature on "self-willed death", "voodoo death", and the Australian aboriginal practice of "pointing the bone".**(63)**

"Pointing the bone" literature indicates that five specific conditions must be present in order for the subject to die; viz., that the subject:

(a) must have *acted* in a specific way that *transgressed* some particular law;
(b) must *accept* that the *appropriate penalty* for performing that specific act is death;
(c) must *know* that the operator has performed a "pointing the bone" ritual;
(d) must *accept* that the operator is an *appropriate* and *suitable* person to "point the bone"; and
(e) must *accept* that the final outcome of a "pointing the bone" is that the target of the ritual dies.**(64)**

It seems that there are only two ways that the fatal outcome of a "pointing the bone" ritual can be nullified:

(a) engage a more powerful witch-doctor to cast a counter-spell; or
(b) expose the operator as an impostor who is not of a status appropriate to cast the spell.**(65)**

"Illata" and "Abstracta"

To Dennett (1987, p.52), it is "the myth of our rational agenthood" that allows us to structure and organize "our attributions of belief and desire to others", and to regulate "our own deliberations and investigations".

In order to clarify this point, he speaks of two sorts of theoretical entities:**(66)**

(1) *Illata*: "*posited theoretical entities*", the presence of which have been inferred; e.g., radio waves, atoms and invisible gases;**(67)**

(2) *Abstracta*: "*calculation-bound entities*" or "*logical constructs*" which are convenient fictions; e.g., a "*centre of gravity*"(D), the "*equator*"(D), "*the financial crisis*"(P), and "*the spirit of the nation*"(P).**(68)**

From a view that the ordinary notion of *belief* stands "somewhere midway between being *illata* and being *abstracta*" (1987, p.55), and that the notion is being "pulled in two directions", Dennett (1987, p.55) proposes that, in order to totally clarify the confusion and ambiguity between his use of the terms *abstracta* and *illata*, the terms should be understood in a different way, namely:

(a) *Intentional System Theory*: which is "strictly abstract, idealizing, holistic, [and] instrumentalistic";**(69)** and

(b) *Sub-Personal Cognitive Psychology*: which is "a concrete, micro-theoretical science of the actual realization of those intentional systems" respectively.

Arguing strongly for *intentional system theory*, Dennett (1987, p.59) states that direct knowledge of the physiological underpinnings of these mechanisms (i.e., the capacities to *acquire beliefs*, *have desires* and *perform intentional acts*) is no help whatsoever; simply because, due to the complexity of individual humans (and the structural and social differences between them), it is unlikely that these "useful traits" will share "a common description at any level more concrete or less abstract than intentional system theory".**(70)**

The utility of the "Abstracta"

As Dennett remarks (1987, p.60), *if* the *abstracta* that are generated by the "principled blindness… to internal structure" of the *intentional system theory***(71)** are so empirically successful in predicting and/or explaining behaviour — and it certainly seems that they are — it would be "a miracle" if there was not "some way in which the internal processes of the system mirror the complexities of intentional interpretation".**(72)**

Dennett draws a useful analogy to the chemical concept of *valency* (the combining power of an atom), arguing that people, given their evolved complexity and individual life history, are most unlikely — compared with, say, individual atoms of carbon (of valency **4**) — to have very much in common in terms of the actual mechanical structure individually responsible for a particular set of beliefs.

Corporate entities as Intentional Systems

In arguing for his preferred *abstracta* model (of *beliefs* and *desires* and *intentions*), and against *illata*, Dennett describes the inter-connected, holistic nature of these attributed mental states as follows:

> The *subject* of all the intentional attributions is the whole system (the person, the animal, or even the corporation or nation) rather than any of its parts, and individual beliefs and desires are not attributable in isolation, independently of other belief and desire attributions. (1987, p.58; emphasis in original).

Clark (1994), inspired by this statement of Dennett, found that the *behaviour* of corporate entities (including governments) "that otherwise would remain unintelligible and unanticipated" (p.404) *could* be predicted or explained in terms of attributed *beliefs* and *desires* in a similar fashion to that of humans.**(73)**

Clark found that every criterion required for the successful application of Dennett's "intentional stance" to people was also satisfied by corporate entities (e.g., the State Department, General Motors, the French Government) — or, even, perhaps, that Dennett's "intentional stance" is nothing more than a sort of diplomatic protocol translated into human interactions, driven by an embedded view that the individual is a sort of corporate being — and thus, if a corporate entity was treated as a rational agent,**(74)** with beliefs,**(75)** desires,**(76)** and as if it was an Intentional System,**(77)** its behaviour could be successfully predicted (or explained):

> *Beliefs and desires are cited in explanations of corporate behavior with the same degree of success and legitimacy as they are in explanations of human behavior.*
>
> (Clark, p.410)

Clark (p.409) emphasizes Dennett's point that not only is it true that the *physical stance* or the *design stance* can not assist an understanding of the *patterns* that exist in corporate behaviour, it is also true that "some patterns in corporate behavior are accessible only if one adopts the intentional stance towards those entities".

Pickering and Chater

In essence, Pickering and Chater's 1995 paper, "Why Cognitive Science Is Not Formalized Folk Psychology", in *Minds and Machines* (a journal in which "strong stands on controversial issues are specifically encouraged"), rejected the view that Cognitive Science is formalized Folk Psychology — the "received view" that "cognitive science, via the computer metaphor, shows how folk psychological explanation can serve as the basis of a rigorous and scientifically respectable account of mind" (p.309) — and, instead argued that Folk Psychology had no place at all in Cognitive Science. The article was strongly criticized by Morris and Richardson (1995) in the same issue of the Journal (once again, "*strong stands on controversial issues are specifically encouraged*"); and, two years later, the original authors (Chater & Pickering, 1997) responded to that criticism. The overall case advanced by Pickering and Chater is that:

> There appear to be two rather different ways of explaining thought and behavior. The first type is our everyday explanation of each other's behavior in terms of propositional attitudes, such as belief and desire [which is called folk psychology]. The second type of explanation attempts to understand the mind in computational terms [which is called cognitive science]. (Chater & Pickering, 1997,p. 553)

(Ignoring the fact that they seem define "cognitive science" as nothing more nor less than artificial intelligence), they claim that Cognitive Science and Folk Psychology are "*independent enterprises*" that should not be seen as either "*cooperative*" or as "*standing in competition*" (1995, p.311); essentially because they are concerned with different *aspects of mental life*, and habitually employ different sorts of explanation:

> The separateness of cognitive science and folk psychology stems from the fact that the aspects of mental life with which they are concerned do not overlap: folk psychology applies to "knowledge-rich" aspects of cognition, which have proved completely unamenable to cognitive science, whereas cognitive science has been limited to "knowledge-free" aspects of cognition, about which folk psychology is silent. (1995, p.310)

> Folk-psychological explanations are "knowledge-rich; they make reference to common-sense argument and knowledge. Cognitive-scientific explanations are "knowledge-free"; they eschew common-sense. (1995, p.319, punctuation altered for clarity)

Their distinction of "knowledge-free" (**N.B.** not "impoverished"; but "free") and "knowledge-rich" (i.e., "rich" in terms of *propositional* knowledge) is a useful one.

"Knowledge-free" activities are quite mechanical when they are contrasted with those that are "knowledge-rich"; due to the fact that you need to know a lot in order to perform those "knowledge-rich" activities.**(78)**

> According to our view, folk psychology and cognitive science should be seen neither as co-operative nor as standing in competition. They are, *de facto*, independent enterprises, since cognitive science simply cannot handle the knowledge-rich phenomenon or which are the subject matter of folk psychology. This implies that the discussions of folk psychology in the foundations of cognitive science are irrelevant to the current practice in cognitive science, and also has wider significance than the explanation of human behaviour. (1995, p.311)

In many respects, this distinction between "knowledge-rich" and "knowledge-free" enterprises is nothing more than a variant of the "top down" (cognitive psychology) and "bottom up" (neuroanatomy) distinction; and, as such, it seems absurd to say that one is to be accepted and the other rejected.

In the overall scheme of Cognitive Science (as represented in **Fig.1**) there is plenty of room for both approaches to work, usefully interact with each other and contribute to the common corpus of knowledge; for, as Machiavelli wrote "those who paint landscapes place themselves in a low position on the plain in order to consider the nature of the mountains and the high places and place themselves high atop mountains in order to study the plains".**(79)**

How the "knowledge-rich" contributes to Cognitive Science

Dennett, amongst many others, has identified a natural category — the capacity to "mind-read" — as an important part of the overall notion of a "Theory of Mind".

The existence of this category has not only been confirmed through the observation of its day-to-day *presence* in the routine "intentional stance" application, but also through its *absence* in a natural group of people (those with autism) which had already been established by other scientists, for different reasons (viz., behavioural deficits); and, as described below, the fact that this is a group has been further confirmed, by scientists with yet another theoretical position, from the anatomical evidence of the absence of a particular, specific psychophysiological function.**(80)**

"Mirror Neurons"

For some time researchers with various theoretical commitments had been trying to establish brain correlates for different sorts of physical movement. A major project has been the development of robotic limbs that operate, effectively, with the "power of thought". Mussa-Ivaldi (2000, p.306) describes work by Wessberg and colleagues who:

> … have used electrical signals from five regions in the cerebral cortex of monkeys to drive the movement of robotic arms.
>
> Such "brain–computer interfacing" has clear-cut clinical aims. The ambitious goal is to provide amputees and patients suffering from a variety of severe motor disorders — such as paralysis and amyotropic lateral sclerosis — with the means to act and communicate by replacing the control of muscles with the control of artificial devices by brain activity.

In the last thirty years, investigative technology has opened up new avenues of research. In particular, the non-invasive tool known as functional magnetic resonance imaging (fMRI), which actively monitors the brain's response to different stimuli in "real time" by detecting oxygen levels (Logothetis, 2001). It is also significant that specific activity in monkey's brains have been shown to have a high level correlation with that in analogous areas in humans (Bremmer, et al., 2001).

The work of researchers such as Rizzolatti, Gallese and Fadiga,**(81)** has identified specific motor neurons dedicated to particular movements (Gallese & Goldeman, 1998, pp493/495):

> 'Grasping neurons', 'Holding neurons', 'Tearing neurons' and 'Manipulation neurons'. Grasping neurons discharge when the monkey performs movements aimed to take possession of objects with the hand ('Grasping-with-the-hand neurons'), with the mouth ('Grasping-with-the-mouth neurons'), or with both.

The astonishing thing is that many of these same neurons fire when the monkey is observing another perform the same action. These have been termed "mirror neurons".**(82)** Subsequent research (e.g., Rizzolatti, et al. 1996) has identified the same "mirror neurons" in humans.

According to Motluk (2001), Alvin Goldman attended a 1998 lecture given by Gallese about his work with "mirror neurons" and, for the first time, brought to Gallese's attention the fact that the "mirror cells" might have some connexion with the capacity of people to "mind-read" (Gallese & Goldman, 1998). Subsequent work with autistic people has confirmed this.

It also appears very likely that these "mirror neurons" may well be the biological basis for empathy.

In early 2001 Bradshaw and Mattingley reported the anecdotal case of a man who had died of lung cancer in 1993. Around 1990, as his disease moved into its final stages, he experienced a lot of cervical pain and stiffness. Although "he had also, apparently, experienced head trauma in the war", it was not until around the same time (Bradshaw, 2002) that, according to his widow, he began to manifest very unusual behaviour:

> He was… very sensitive to touch; even the slightest hand contact gave the impression of sharp fingernails. Of particular interest was his widow's recent [viz. 2000] observation that "If I slightly knocked my finger, spontaneously showing him, he would immediately grasp his own finger and say "don't do that (meaning not to show him *suddenly*); he actually felt it. If I merely commented (that I had knocked my finger), there was no such reaction". In interview, she recounted other similar events. The experience was suddenly immediate and intense, and, apparently, qualitatively similar to the hypersensitivity occasioned by actual contact…
>
> (Bradshaw & Mattingley, corrected, 2002, p.136)**(83)**

Unknown to Bradshaw and Mattingley their speculation that this was "a sensory analogue of motor mirror neurons" had already been actively supported by the work of Hutchison and his colleagues (Hutchison, et al. 1999) who, in the process of testing the response of various neurons to noxious or painful stimuli, discovered that one cell which responded to "noxious mechanical stimulation" (viz., pinpricks or pinching) alone, "but not to noxious heat, cold or non-noxious stimuli (touching, rubbing, deep pressure, dull probing)… also responded when the patient watched *pinpricks being applied to the examiner's fingers*" (Hutchison, et al. 1999, p.404, emphasis added).

Future Research

Given the recent findings in relation to the brain and hypnosis (Maquet, et al. 1999; Rainville, et al. 1999), which have confirmed that there are indeed brain correlates for hypnosis, and the discovery of mirror neurons, there seems to be great scope for research into various aspects of hypnosis; for example:

(1) Whether "mirror neurons" play any part in the capacity to create and manipulate "mental imagery";

(2) The rôle that "mirror neurons" play in determining the degree of responsiveness in a willing subject (both in terms of ease of hypnotizing and level of hypnotic talent displayed);

(3) If, so, measuring the effectiveness of various styles of hypnotic suggestion;

(4) Whether "mirror neurons" have any impact on the effectiveness of hypnotic outcomes (i.e., the more mirror neurons, the better the outcome);

(5) The rôle of "mirror neurons" in shamanic practices;

(6) Whether "mirror neurons" play any part in "mental imagery";

(7) Various projects connected with the use of imagery to treat disease, heal illness, and repair injury; and

(8) Question of whether the concept of "mirror neurons" casts any light on the issue of the influence of exposure to violence on children.

Conclusion

It certainly seems that, in recent years, Folk Psychology has made a very significant contribution to the overall body of knowledge of Cognitive Science and, as well, to the direction in which it is moving.

Despite the fact that it may be far less precise than, say, neuroanatomy, the rôle of Folk Psychology may well turn out to "fit" quite well (in the sense that a skeleton key simply "fits" a lock), and we may discover that it is extremely good at "opening" the way to a solution — and, like the skeleton key, does so without knowing anything at all about the precise core structure underlying the circumstances in question.

=================={NOTES}===============

(1) Harnish (2002, p.2) expresses the widely accepted "broader" view:

> As a first approximation, cognitive science, broadly construed, is the scientific study of cognition. It is basically a *domain* of investigation plus a set of *procedures* for investigating that domain — a "discipline". A good example of this conception is Norman [viz., "What is cognitive science", 1981]:
>
> *"Cognitive Science is a new discipline, created from a merger of interests among those pursuing the study of cognition from different points of view. The critical aspect of Cognitive Science is the search for understanding of cognition, be it real or abstract, human or machine. The goal is to understand the principles of intelligent, cognitive behavior. The hope is that this will lead to better understanding of the human mind, of teaching and learning, of mental abilities, and of the development of intelligent devices that can augment human capabilities in important and constructive ways."*

(2) Roth (2001, pp.55-56), uses a "zoom lens" analogy of to describe the movement between different fields of attention; implying movements between the near and distant, the wide and the narrow view, and the fact that multiple levels reveal different aspects.

Despite the differences in the paradigms that drive each domain, it is significant that, to the extent to which each domain has a "scientific" approach, the accuracy of its routine measurements and the correctness of its reports of actions, phenomena and behaviour are taken for granted; even though its conclusions might well be rejected outright by those in another domain.

(3) According to Symons (2002, p.4), the first to use "folk psychology" in this sense was Daniel Dennett in 1978 (q.v., Dennett, 1987, footnote to p.43). It would seem, however, that others had also identified the notion of a "folk psychology"; e.g., Lewis (1972, pp.249-250):

> Theoretical identifications *in general* are implied by the theories that make them possible — not posited independently. This follows from a general hypothesis about the meanings of theoretical terms: that they are definable functionally, by reference to causal roles. Applied to common-sense psychology — folk science rather than professional science, but a theory nonetheless — we get the hypothesis of my previous paper that a mental state **M** (say, an experience) is definable as the occupant of a certain causal role **R** — that is, as the state, of whatever sort, that is causally connected in specified ways to sensory stimuli, motor responses, and other mental states.

(4) Foss and Bow explain that:

> People understand the actions of others by viewing [their] actions as purposive, as goal-directed. People use their knowledge of…. the types of goals people have and of the types of plans they devise in service of those goals, to understand action sequences that are described in narratives or observed directly…
>
> [This] understanding involves inferring the intentions (i.e. the plans and goals) of the characters, speakers, or actors… [which is done] by *generating expectations* and *drawing inferences* in order to come up with a plan that explains an actor's behavior. (1986, p.4: emphasis added)

Whiten (1993, p.376) reports that even chimpanzees can attribute intentions:

> In one condition of [Povinelli and Boysen's] experiment, a person approached the chimpanzee's cage with a cup of highly prized juice, but "accidentally" spilled it: whereas in the alternative condition, a person "deliberately" poured the juice on the floor. When then given the choice of selecting one of these people to get the next cup of juice, the

> chimp consistently chose the one who had only "accidentally" spilled the juice, suggesting an ability to discriminate intentional from non-intentional action in others.

Emery and Clayton (2001) also report that scrub jays alter their food caching behaviour to minimize potential stealing by their con-specifics, by attributing a theory of mind them.

(5) It's clear that Gordon's psychological competence is analogous to Chomsky's linguistic *competence* (vs. *performance*); where *competence* is the "knowledge of language", and *performance* is the "use of that knowledge" (Smith, 1999, p.28).

Bolton and Hill (1996, p.17) stress that:

> …folk psychology does not serve only the hermeneutic purpose of making sense of the phenomena retrospectively, but also facilitates the prediction of action. This may be made by a detached observer, but prediction here also, and most importantly, means the mutual anticipation which is a condition of life.
>
> Folk psychology includes explanations of actions in terms of beliefs and desires, but also accounts of the origins of beliefs in terms of experience, of experience in terms of reality, and of desire in terms of need…

(6) Churchland (1991,p.59) observes:

> People who are congenitally deaf or blind know quite well that normal people have perceptual capacities beyond what they themselves possess, and they know in some detail what those capacities entail in the way of knowledge and behavior. People who have never felt profound grief, say, or love, or rejection, can nonetheless provide appropriate predictions and explanations of the behaviour of people so afflicted, And so on. In general, one's immediately available understanding of human psychology and behavior goes substantially beyond what one has experienced in one's own case, either in real life or in pointed simulations. First-person experience or simulation is plainly not *necessary* for understanding the behavior of others.

(7) According to Greenwood (1991, p.17):

> The closest scientific analogue of folk-psychological explanation is in fact not cognitive psychology [which explains cognitive processing] but social psychology [which explains human actions].

Tye (1989, p. 182) makes a similar distinction: Whilst "the distinctive questions of cognitive psychology are "*how*" questions pertaining to the exercise of our cognitive capacities" — with cognitive psychologists involved in "[trying] to explain how we remember, how we understand how we form mental images, how we perceive, and so on" — the typical domain of folk psychology is "[dealing] with "why" questions pertaining to our manifest behaviour".

(8) For Wundt, the *Volk* part of *Völkerpsychologie* meant the same as it did when Hitler, in his speeches that were directed at all ethnic Germans (regardless of their geographical situation), spoke of "My German *Volk*". Wundt (1916, p.4) took pains to distinguish his "Ethnopsychology" (*Völkerpsychologie*) — using the meaning Lazarus and Steinthal first introduced in the 1860s — from both "Community Psychology" (*Gemeinschaftspsychologie*) and "Social Psychology" (*Sozialpsychologie*). According to the Oxford English Dictionary, the first English use of "ethnopsychology" for *Völkerpsychologie* in 1886 (with 'folk psychology' first used in1889).

(9) For example, Epstein (1997) examines whether there is any experimental evidence to support the proverbial wisdom contained in precepts such as "All work and no play makes Jack a dull boy", "Spare the rod and spoil the child", etc.

(10) This is also true for suicide. Simpson (2001, pp.6-13) states that the two most important features of an act a coroner would label as suicide are "*intent to die*" and "*level of lethality*". It is also true, however, that:

> someone can have an extremely high intent to die, but if through ignorance they choose a means of suicide that has a low lethality [e.g., overdose], then there is a good chance they will not kill themselves. Conversely a person may have a low level of intent to die, but if they choose a highly lethal means of suicide [e.g., shotgun], then they could end up dead. (p.11)

(11) Hart (1962/1968, pp.182-183):

> Human society is a society of persons; and persons do not view themselves or each other merely as so many bodies moving in ways which are sometimes harmful and have to be prevented or altered. Instead persons interpret each other's movements as manifestations of intention and choices, and these subjective factors are often more important to their social relations than the movements by which they are manifested or their effects. If one person hits another, the person struck does not think of the other as just a cause of pain to him; for it is of crucial importance to him whether the blow was deliberate or involuntary. If the blow was light but deliberate, it has a significance for the person struck quite different from an accidental much heavier blow. No doubt the moral judgments to be passed are among the things affected by this crucial distinction; but this is perhaps the least important thing so affected. If you strike me, the judgment that the blow was deliberate will elicit fear, indignation, anger, resentment: these are not voluntary responses; but the same judgment will enter into deliberations about my future voluntary conduct towards you and will colour all my social relations with you. Shall I be your friend or enemy? Offer soothing words? Or return the blow? All this will be different if the blow is not voluntary. This is how human nature in human society actually is and as yet we have no power to alter it. The bearing of this fundamental fact on the law is this. If as our legal moralists maintain it is important for the law to reflect common judgments of morality, it is surely even more important that it should in general reflect in its judgments on human conduct distinctions which not only underly morality, but pervade the whole of our social life. This it would fail to do if it treated men merely as alterable, predictable, curable or manipulable things.

And, of course, when there is no one else to blame, "God" cops it ('an act of God').

(12) As Smith (2002, p.7) observes: "an appropriate emotion elicited by an irrational belief is not in itself an irrational emotion". Freud's "*Rat-Man*" case notes includes a view that behaviour may not be due to a client's supposed cause; requiring, of course, the 'real cause' to be earnestly sought and dramatically revealed by the omniscient Freud:

> Hearing this [viz., the client's causal misattribution], I took the opportunity of giving him a first glance at the underlying principles of psycho-analytic therapy. When there is a *mésalliance*, I began, between an affect and its ideational content (in this instance, between the intensity of the self-reproach and the occasion for it), a layman will say that the affect is too great for the occasion — that it is exaggerated — and that consequently the inference following from the self-reproach (the inference that the patient is a criminal) is false. On the contrary, the [analytic] physician says: 'No. The affect is justified. The sense of guilt is not in itself open to further criticism. But it belongs to some other content, which is unknown (*unconscious*), and which requires to be looked for.
>
> (Freud, 1909/1955, pp.175-176)

(13) The term *cognitive therapy* is intentionally equivocal in that it simultaneously describes a system that believes the clients "cognitions" (rather than their actions) should be "therapized" and a system whose "therapeutic acts" are conducted at "a cognitive level" — i.e., rather than at the physical level (e.g., surgery) or systemic level (e.g., drug therapy).

(14) Epictetus, *The Enchiridion*, (G. Long's 1890 translation), from pp.132–138, Navia L.E. & Kelly E. (eds.), *Ethics and the Search for Values*, Prometheus Books, (Buffalo), 1980:

> V. Men are disturbed not by the things which happen, but by the opinions about the things: for example, death is nothing terrible, for if it were, it would have seemed so to Socrates, for the opinion about death, that it is terrible, is the terrible thing. When then we are impeded or disturbed or grieved, let us never blame others, but ourselves, that is, our opinions. It is the act of an ill-instructed man to blame others for his own bad condition; it is the act of one who has begun to be instructed, to lay the blame on himself; and of one whose instruction is completed, neither to blame another, nor himself.

(15) These therapists (Beck, Perls, LeShan , Ellis, etc.) had all originally trained in Freud's classical psycho-analysis, They worked to change (otherwise inevitable) future behaviour by helping clients reach a different, more 'rational' understanding of the world.

It is highly significant that these cognitive, 'talking therapies' have been shown to be just as effective as medication in altering actual brain function (Gabbard, 1992; Baxter, et.al., 1992; Schwartz, et.al., 1996).

(16) Festinger's original intention was to study how people could be induced to change their fixed views. He soon abandoned his intended study because of its "*extraordinary difficulty*" (1957, p.vii) and, instead, devoted his efforts to studying why people continued to maintain a particular view despite the presence of powerful contradictory evidence.

He examined interactions between "cognitions" in two extreme situations: where the two "cognitions" were (a) consonant with each other; and (b) dissonant with each other.

This cognitive dissonance (Heider called it "cognitive imbalance") was a qualitative description of the mutually exclusive nature of the relationship between the two related "cognitions". with the magnitude of the dissonance being determined by the degree of inconsistency between the two.

He discovered that, whenever cognitive dissonance occurred, humans had a strong natural tendency towards cognitive consistency, through a process of "*dissonance reduction*", which usually took one or more of four forms:

(1) *changing* one or more of the beliefs/opinions/behaviours involved in the dissonance;
(2) *acquiring* new information/beliefs that would reduce the existing dissonance (by increasing the existing consonance);
(3) *forgetting* whichever "cognitions" were currently in the dissonant relationship; and/or
(4) *reducing the importance of* whichever "cognitions" were currently in the dissonant relationship.

According to Festinger (1957, p.18):

> The presence of dissonance gives rise to pressures to reduce or eliminate the dissonance. The strength of the pressures to reduce the dissonance is a function of the magnitude of the dissonance.

(17) The concept of "*learned helplessness*", based on the ideas of Rotter, comes from the work of Seligman and his colleagues (principally Maier) in the 1960s, who sought to explain why non-active, passive behaviour was chosen by certain people in certain circumstances. The term itself was coined by Seligman. In Seligman's view "*helplessness*" was:

> a learned state produced by exposure to noxious, unpleasant situations in which there is no possibility of escape or avoidance. In the experimental demonstrations that serve as the analog of the effect in humans, repeated inescapable shocking of a dog produces a kind of pathological helplessness so extreme that even when an avenue for escape is provided the animal will not take it. Interestingly, preceding the inescapable shock trials by only a few trials in which the animal can escape prevents the syndrome from developing. (Reber, 1985, p319)

(18) Mead (p.151):

> If we contrast play with the situation in an organized game, we note the essential difference that the child who plays in a game must be ready to take the attitude of everyone else involved in that game, and that these different rôles must have a definite relationship to each other. Taking a very simple game such as hide-and-seek, everyone with the exception of the one who is hiding is a person who is hunting. A child does not require more than the person who is hunted and the one who is hunting. If a child is playing in the first sense [viz. pretending to be a policeman] he just goes on playing, but there is no basic organization gained. In that early stage he passes from one rôle to another just as a whim takes him. But in a game where a number of individuals are involved, then the child taking one rôle must be ready to take the rôle of everyone else. If he gets in a [baseball] nine he must have the responses of each position involved in his own position. He must know what everyone else is going to do in order to carry out his own play. He has to take all of these rôles. They do not all have to be present in consciousness at the same time, but at some moments he has to have three or four individuals present in his own attitude, such as the one who is going to throw the ball, the one who is going to catch it, and so on. These responses must be, in some degree, present in his own make-up. In the game, then, there is a set of responses of such others so organized that the attitude of one calls out the appropriate attitudes of the other.

(19) Piaget's notions (e.g., Piaget, et al. 1932; Piaget & Inhelder, 1951/1975) on the sequential development of the child paid great attention to the development of an understanding of the mind of another; even, for example, gaining the notion that another could deliberately lie: "to tell a lie is wittingly and intentionally to betray the truth" (Piaget, et al., 1932, p.136).

(20) See, for example, Borst (1993) and Squires (1995). Borst (p.487):

> The term ["solipsism"] derives from the Latin "*solus ipse*". This means literally "self alone", and less literally either "I alone exist" or else "I alone am conscious", yielding in the first case a more idealist form of solipsism querying the existence of an independent material world, and in the second case a more materialist form allowing for the (possible) existence of a material world but again not countenancing the existence of other minds or centres of consciousness.

(21) Borst (1993, p.487); quoting from Russell's 1948 work, *Human Knowledge*.

(22) This work with primates had been somewhat anticipated by Jolly (1966) and Humphrey (1976), and was subsequently expanded into what Byrne and Whiten called "Machiavellian Intelligence" (Whiten, 1999). See also Crow (1993), Wilson, Near and Miller (1998), Sutton and Keogh (2000), Sutton, Reeves and Keogh (2000) and McHoskey (2001a and 2001b)

> Brain size increased rapidly in primate evolution. What then is the exceptional problem to which the large brain of the primate, with man as the most egregious example, is the response? Machievellian intelligence is the notion that the environmental

> challenge is not physical, but is social, arising from con-specifics. Members of the same species are both potential aids and threats to survival. The individual must learn whether and when to collaborate or to compete. The primate brain has developed an "awareness of awareness", an ability to conceive other individuals as having aims and desires that are similar, but often in conflict with its own, and to use this awareness to its advantage. The brain is a device for gaining an advantage over a con-specific while concealing the fact that a loss has been incurred. Crow (1993, p.596)

(23) No doubt the ease in which the term "theory of mind" was adopted so rapidly amongst psychologists was due to the fact Mead and Piaget had anticipated this concept in their work on the child developing a capacity to understand that others thought differently from itself.

(24) The word 'Theory' in *Theory of Mind* does not mean an "actual scientific theory" (Flavell, 1999); the word is used to register the fact that we are simply speaking of an *ad hoc* aggregate of intellectual speculations (i.e., as distinct from a systematic aggregate of empirically well established facts). However, Gordon and Barker (1994) identify many problems caused by individuals misusing *Theory of Mind* ("a capacity to attribute mental states") to mean something like "a theory, the possession and use of which permits the full development of psychological competence". (Throughout this essay I will consistently use *Theory of Mind* to denote "a capacity to attribute mental states".)

(25) "*Mind-reading*" (the ability present) is often used to emphasize the contrast with its corresponding absence, called "*mindblindness*" by Baron-Cohen (1995).

(26) In many ways, the entire concept can be thought of as an extension of the (far more linguistics oriented) traditional philosophical problem, known as the "*other minds*" problem.

(27) Or, as Pinker (1997, p.329) would have it:

> We are all psychologists. We analyze minds not just to follow soap-opera connivings but to understand the simplest human actions.

(28) Flavell (*op.cit.*) also comments that, over this time:

> The majority of developmental studies classed as metacognitive have investigated children's metamemory, that is, their knowledge about variables affecting memory performance and, especially, their knowledge and use of memory strategies.

(29) For example, Lewis (1969, p78) defined a convention in this way:

> A regularity **R** [e.g., driving on the left] in the behavior of members of a population **P** when they are agents in a recurrent situation **S** is a *convention* if and only if it is true that, and it is common knowledge in **P** that, in almost any instance of **S** among members of **P**,
>
> (1) almost everyone conforms to **R**;
> (2) almost everyone expects almost everyone else to conform to **R**;
> (3) almost everyone has approximately the same preferences regarding all possible combinations of actions;
> (4) almost everyone prefers that any one more conform to **R**, on condition that almost everyone conform to **R**;
> (5) almost everyone would prefer that any one more conform to **R'**, on condition that almost everyone conform to **R'**,
>
> where **R'** is some possible regularity [e.g., driving on the right] in the behavior of members of **P** in **S**, such that almost no one in almost any instance of **S** among members of **P** could conform both to **R'** and to **R**.

(30) Flavell (2000, p.19) describes it this way:

> Infants are born with or develop early a number of abilities and dispositions that will help them learn about people. They find human faces, voices, and movements highly interesting. They have impressive abilities to perceptually analyse and discriminate human stimuli. They seem impelled to attend to and interact with other people and they certainly impel other people to attend to and interact with them. Babies respond differently to people than they do to objects and seem to expect people to behave differently than objects do. More specifically, we could say that they come to construe people as "compliant agents", that is, as objects that are self-propelled and capable of independent movement (agents) but also influenceable at a distance by communicative signals (compliant). One can hardly imagine a more felicitous initial design for a creature destined for theory-of-mind development.

(31) Goldie and Spicer (2002, pp.4-5) suggest that there may well be far more to it:

> [There is] a further avenue open for ontological investigation: one concerning the relation between commonsense psychology and the emotions. Commonsense psychology has been described as the capacity to 'mind-read' … But it might be that, as well as *mind-reading*, commonsense psychology plays a role in *mind-shaping*, so that our psychological make-up might be constitutively dependent upon our possession of commonsense psychology. With respect to the emotions, the suggestion is that emotional experiences might *themselves* depend upon our commonsense psychological capacities, so, as well as allowing us to think about minds, commonsense psychology might also contribute to the shape of emotional episodes. For example, part of what gives an attack of jealousy its shape, part of what makes it unfold in the way it does on a certain occasion, will be the jealous person's attitudes towards the thoughts and feelings of himself and others, which attitudes are themselves built from the resources of his commonsense psychological capacities. Much of philosophical interest lies here, concerning both the viability of conceptual revision within commonsense psychology and the epistemology of one’s own and other minds.

(32) Two example of the “commonsense view” not always being “sensible”:

(a) Verkuyl (1988) reports of a 15-year-old Lesotho girl, who had never had a period, who had been “admitted to hospital after a knife fight involving her, a former lover, and a new boyfriend”. She had a single stab-wound in the upper abdomen. The knife had pierced her stomach twice. They cleaned the wounds, sewed her up and sent her home. “Precisely 278 days later the patient was admitted again to hospital with acute, intermittent abdominal pain.” Examination revealed that she was pregnant. The baby was delivered by caesarian section.

Yet, due to a congenital deformity, the girl had no external vagina at all!

(“Inspection of the vulva showed no vagina, only a shallow dimple was present below the external urethral meatus and between the labia minora.”)

Eventually the following facts came to light:

> The patient was well aware of the fact that she had no vagina and she had started oral experiments after disappointing attempts at conventional intercourse.
>
> Just before she was stabbed in the abdomen she had practised fellatio with her new boyfriend and was caught in the act by her former lover. A fight with knives ensued.

Concluding that the sperm must have gained access to the ova “via the injured gastrointestinal tract”, and that the total absence of any waste blood in the uterus would strongly indicate that the girl “became pregnant with her first or nearly first ovulation”, Verkuyl adds: “the fact that the son resembled the father excludes an even more miraculous conception”.

(b) After extensive research Abd-El-Maeboud and his co-workers (1991), established the counter-intuitive fact that inserting rectal suppositories "blunt-end" first (rather than "pointy-end" first) was the most productive. This method not only had a higher rate of initial "retention", with the "need to insert a finger in[to] the anal canal" being around 1% (vs. 83%!!), but, also, a lower "expulsion rate" (0% vs. 3%).

(33) In 1999, based on an examination of a large number of published findings on particular aspects of specific mental states, and the wide range of different views on (and supposed explanations of) **ToM** contained within them, Flavell (1999, p.27) has proposed a composite theory, comprised of the best elements of each, in order to adequately represent the situation:

> (1) that development in this area builds from innate or early maturing people-reading capacities;
>
> (2) that we have some introspective ability that we can and do exploit when trying to infer the mental states of other creatures who are like ourselves but in a different psychological situation (e.g. ignorant of the facts, differently motivated);
>
> (3) that much of our knowledge of the mind can be characterized as an informal theory;
>
> (4) that improved information-processing and other abilities (e.g., linguistic skills) enable and facilitate theory-of-mind development (and certainly help children show what they know on theory-of-mind tasks); and
>
> (5) that a variety of experiences serve to engender and change children's conceptions of the mental world and their ability to use these conceptions in predicting and explaining their own and other people's behaviour.

(34) Empirical studies (Pacherie, 1997, p.216) have clearly established that:

> Children with autism have great difficulties correctly predicting the beliefs of others. They have a specific difficulty in understanding psychological but not physical causality. Although they can understand simple desires, they have difficulties predicting the desires of others when they conflict with their own. They show little or no spontaneous pretend play. They are less able than controls to distinguish between mental and physical states and to understand the mental functions of the brain.

(35) According to McCabe, *et al.* (2000, p.4406):

> The child, when told, "Make it so Mommy can't see the car", responds by putting the toy in his pocket and nonchalantly relaxing his arms at the side. Such blind children are ware of mental phenomena in others, of what "seeing" is to sighted people, and will say, "See, it's in my lap"…

(36) Kanner, coined the term "*infantile autism*" based on Bleuler's "*autismus*" (Greek, *autos*, "self"), the morbid self-absorption and lack of contact with reality noted in schizophrenics. He had recognized a pattern in 11 children under his care, all of whom:

> … had in common four traits: a preference for aloneness, an insistence on sameness, a liking for routines and some abilities that seemed remarkable compared with the deficits.
>
> Concurrently, though quite independently, Hans Asperger of the University Pediatric Clinic in Vienna prepared his doctoral thesis on the same type of child. He also used the term "autism" to refer to the core features of the disorder. Both men [had] borrowed the label from adult psychiatry, where it had been used to refer to the progressive loss of contact with the outside world experienced by schizophrenics. Autistic children seemed

> to suffer such a lack of contact with the world around them from a very early age. (Frith, 1997, p.92)

(37) For example, those that hold the "executive function deficit approach" (as distinct from the "mental module deficit approach") feel that:

> … the primary impairment in autism may be an impairment in executive function, defined as: "the ability to maintain an appropriate problem-solving set for attainment of a future goal, [that] includes behaviours such as planning, impulse control, inhibition of prepotent but irrelevant responses, set maintenance, organized search, and flexibility of thought and action". It suggests, in turn, that the problems encountered by subjects with autism on theory of mind and on pretence may be traced back to executive function deficits. (Pacherie, 1997, p.216)

(38) Perkins (1983, p.360), refers to the results of this "*machine style*" of perception as a "*physicist's system*".

(39) Like Rudyard Kipling's *Just So Stories*, the theme of the "*design*" category is that things are simply just that way: a parallel to the doctoral candidate in Molière's *Le Malade imaginaire*, who, when asked why opium made people go to sleep, spoke of it having a "dormitive virtue" (a sleep-inducing factor).

> If you know something about the design of an artifact, you can predict its behavior without worrying yourself about the underlying physics of its parts. Even small children can readily learn to manipulate such complicated objects as VCRs without having a clue how they work; they know just what will happen when they press a sequence of buttons, because they know what is designed to happen. They are operating from what I call the *design stance*. (Dennett, 1995, p.229)

(40) Perkins (1983, p.360), refers to the results of this "*human style*" of perception as a "*pragmatist's system*".

(41) Observing that the term "belief" has a very wide range of meanings — and remarking that "we seldom talk about what people *believe*, we [usually] talk about what they *think* and what they *know*" — Dennett (1987, p.46) produces a precise definition: "folk psychology has it that *beliefs* are information-bearing states of people that arise from perceptions and that, together appropriately related *desires*, lead to intelligent *action*".

(42) Brentano added this explanation of "*intentional*" to his 1911 edition (*op.cit.* pp.180-181):

> This expression had been misunderstood in that some people thought it had to do with intention and the pursuit of a goal. In view of this, I might have done better to avoid it altogether. Instead of the term "intentional" the Scholastics very frequently used the expression "objective". This has to do with the fact that something is an object for the mentally active subject, and, as such, is present in some manner in his consciousness, whether it is merely thought of or also desired, shunned, etc. I preferred the expression "intentional" because I thought there would be an even greater danger of being misunderstood if I had described the object of thought as "objectively existing", for modern-day thinkers use this expression to refer to what really exists as opposed to "mere subjective appearances".

Dennett constantly speaks of the "aboutness" of *intentionality*; for example: "the aboutness of the pencil marks composing a shopping list is derived from the intentions of the person whose list it is" (Dennett, 1995, p.240)

(43) In addition to cogitations (such as judgement, recollection and inference) and emotions (such as joy and sorrow and fear), Brentano (*op.cit.* p.79) includes things such as "hearing a sound, seeing a colored object, feeling warm or cold" in his category of mental phenomena.

(44) By contrast, Brentano (*op.cit.* p.80) includes things such as "a color… a chord which I hear, warmth, cold, odor which I sense" in his category of mental phenomena.

(45) Whilst the term "*inexistence*" appears haphazardly right throughout the text as both *in-existence* and *inexistence*, it very clearly always carries the "inherence" meaning (i.e., the fact or condition of *existing in something*), rather than the "non-existence" meaning (i.e., the fact or condition of *not existing*).

(46) Searle (1999a, pp.85-86) clarifies his usage:

> *Intentionality* is an unfortunate word, and like a lot of unfortunate words in philosophy, we owe it to the German-speaking philosophers. The word suggests that intentionality, in the sense of directedness, must always have some connection with "intending" in the sense in which, for example, I intend to go to the movies tonight. (German has no problem with this because *Intentionalität* does not sound like *Absicht*, the word for intention in the ordinary sense of intending to go to the movies.) So we have to keep in mind that in English intending is just one form of intentionality among many.

Foss and Bow (1986, p.94) present a far more A.I.-oriented view:

> We assume that people understand the actions of others by viewing those actions as purposive, as goal-directed. People use their knowledge of human intentionality, of the types of goals people have and of the types of plans they devise in service of those goals, to understand action sequences that are described in narratives or observed directly. Many recent approaches to comprehension emphasize the role of goal-planning knowledge when understanding narratives and conversations, and when remembering observed sequences and goal-directed actions.
>
> According to these approaches, understanding involves inferring the intentions (i.e. the plans and goals) of the characters, speakers, or actors. Such inferences are ubiquitous because narratives frequently provide only sketchy descriptions of the character's actions and goals; speakers rarely state their intentions directly; and observers rarely see all the events preceding or following the action to be explained. Therefore, people are forced to use their general knowledge of human intentionality to fill in the missing information; they do this by generating expectations and drawing inferences in order to come up with a plan that explains an actor's behavior. Although the importance of this type of knowledge for understanding natural discourse and action sequences has been recognized, only recently have cognitive scientists begun examining the psychological processes involved in drawing inferences about human intentionality…

(47) Because we use folk psychology effortlessly all the time to *systematically predict actions*, and because this way of thinking about things seems to be so very effective — Fodor (1987, p.3) speaks of its "extraordinary predictive power" — Dennet (1987, p.50) is certain that the practice of treating others as rational agents must have evolved and developed over time:

> we treat each other as if we were rational agents, and this myth — for surely we are not all that rational — works very well because we are *pretty* rational.

Siegert (2001, p.183), agrees:

> Evolutionary psychology argues that the ability to form a representation of what another human is thinking is an ability that has been acquired and developed through

> natural selection. The ability to interpret other people's facial expressions, their body language, and their tone of voice, has obvious advantages for survival. In earlier environments, our ancestors had to be able determine who was a friend and who was an enemy, who was a potential mate and who was not. The ability to distinguish between facial expressions associated with suspicion and curiosity, fear and anger, or disgust and sadness, may have been the difference between life and death.
>
> In modern society we also rely on this ability for surviving socially, if not literally. Our ability to accurately express our emotions, to know how and when to express them, to know when to conceal our emotions, and to be able read and interpret the emotions of other people are skills that impact hugely on our ability to form lasting relationships, breed and raise healthy children, and gain high status in our careers.

(48) As Dennett remarks (1987, p.52), research into artificial intelligence has shown just how rational we humans actually are: "Even the most sophisticated AI programs stumble blindly into misinterpretations and misunderstandings that even small children reliably evade without a second thought."

(49) It is irrelevant whether the agent actually holds these particular beliefs or not; the critical feature is that the observer ascribes them to the agent. The intentional stance involves an observer amassing a constellation of subjective, *observer-centred* assumptions, unique to that specific observer, that are expressed in the form of a set of supposed beliefs and desires which are attributed to (and projected upon) the object of that observation *in order to explain something to the observer*. The observer is not trying to objectively determine the agent's actual state of mind. His only need is to be able to represent the agent's behaviour to himself in such a way that he can respond to the agent's behaviour.

Consequently, these attributions rarely describe any actual belief or desire an agent might maintain at any time; and the objective truth of the observer's subjective assumptions about the agent's 'inner life' is entirely irrelevant — always provided, of course, that his response to the agent's behaviour has been appropriate.

(50) In other words, humans have a propensity to systematically think as follows: **X** has performed action **A** because she believes **B**, and desires **D**, and (on the basis of her desire for **D**, and her belief that **B** is how things obtain in the real world) **X** has chosen to **A**, with the intention of achieving goal **G** (which, as she understands things, will produce outcome **D**).

This deep desire to eschew disorder and make things systematic has a parallel in the way that humans assess the concept of "randomness". In many circumstances, according to Falk and Konold (1997; 1998), an individual's concept of what is "random" is, in fact, far from it — and this "subjective randomness" is, often, far more disordered than a truly random sequence. Lisanby and Lockhead (1991), also differentiate between *subjective* randomness and *genuine* randomness (upon which they which they bestow the tautologous title of "*stochastic randomness*").

> That subjective randomness results from people's failure to make sense of their observations is not a new idea. Piaget and Inhelder [1951/1975] attribute the origin of the idea of chance in children to their realizing the impossibility of predicting oncoming events or finding causal explanations. The experience of randomness is thus construed as an admission of failure of our intellectual operations. (Falk & Konold, 1988, p.658)

(51) Swinburne (2001, p.39-40) argues that one of the most important features of beliefs is that they are involuntary:

> *Belief is a passive state; believing is a state in which you are, it is not a matter of you doing something. And it is an involuntary state, a state in which you find yourself and which you cannot change at will at an instant. I believe that today is Tuesday, that I*

> *am now in Oxford, that Aquinas died in AD 1274, and so on and so on. I cannot suddenly decide to believe that today is Monday, that I am now in Italy, or that Aquinas lived in the eighteenth century. That belief is involuntary was a claim of Locke, Leibniz, and Hume. "Belief consists", wrote Hume, "merely in a certain feeling or sentiment; in something that depends not on the will, but must arise from certain determinate causes and principles of which we are not masters."*
> [footnote: D. Hume, *Treatise Concerning Human Nature*, Appendix. See also J. Locke: "Assent is no more in our power than knowledge … what upon full examination I find the most probable I cannot deny my assent to" (*Essay Concerning Human Understanding*, 4.20.16). And G. W. Leibniz puts into the mouth of his spokesman Theophilus the claim that beliefs are "inherently involuntary" (*New Essays on Human Understanding*, trans. and ed. P. Remnant and J. Bennett (Cambridge University Press, 1981), 520).]

(52) In addressing cases where an agent's beliefs are *not* "both true and relevant to [his] life" Dennett (1987, p.49) takes a similar stance to cognitive therapists, attributing inappropriate behaviour to the agent's "bad perception" or "bad understanding", rather than to "bad behaviour": "and when false beliefs are attributed, special stories must be told to explain how the error resulted from the presence of features in the environment that are deceptive relative to the perceptual capacities of the system."

(53) Dennett (ibid.) also addresses the cases in which the *desires* are "abnormal" and remarks that "[these] 'abnormal' desires are attributable if special stories can be told." (1987, p.49)

(54) Glass et al. (1979, p.3) distinguish between *content* and *code* as follows:

> A simple English word like *cat* is a representation. It represents a certain *concept* or idea, namely the concept of a furry household pet that purrs. Note that this same concept can be represented in many different ways. We could use a picture of a cat to represent the concept. We could translate *cat* into Spanish and represent it by *gato*. We could represent it in Morse code by a series of dots and dashes, or in Braille by a certain tactile pattern. Across all these examples the information being represented stays the same. This common information is called the *content* of the representation. Each different way the information can be expressed is called a representational *code*. So the words *cat* and *gato* represent the same content, but in different codes (i.e., written English vs. written Spanish). In contrast the words *cat* and *lawyer* represent different contents, but in the same code (written English).

(55) Glass et al. (1979, p.3) distinguish between *code* and *media* as follows:

> Listen to someone singing. Then listen to a recording of the same person singing the same song. The two sounds would probably be virtually identical. Yet the sound would be produced in very different ways — in one case by human vocal cords, in the other by electronic components. These are two different *media* for producing the same auditory code.

They also make the point that "cognitive psychology primarily explores representational codes" (p.24) and "cognitive psychologists study representational codes rather than media" (p.7).

(56) Papineau (1995) defines *instrumentalism* as: "The doctrine that scientific theories are not true descriptions of an unobservable reality, but merely useful instruments which enable us to order and anticipate the observable world" — a parallel to Perkins' "pragmatist's system" (Perkins, 1983, p.360).

(57) Dennett (1991, p.142) argues that whilst folk psychology recognizes "the holism of belief attribution in everyday life":

> …it is not as staunchly realist about beliefs and desires as Fodor is.
>
> So it seems to me that the illusion of realism arises from the fact that we do not just use folk psychology privately to anticipate — each one of us — the behavior of one another. In contrast, if chimpanzees, for instance, use folk psychology (Premack 1986), they do not talk about it. They are *individual* folk psychologists, but we are not. We are *communal* folk psychologists, who are constantly explaining to other people why we think that so and so is going to do such and such. We have to talk; and when we talk, because life is short, we have to give an edited version of what we are actually thinking; thus what comes out is a few sentences. Then, of course, it is only too easy to suppose that those sentences are not mere edited abstractions or distillations from, but are rather something like copies of or translations of the very states in the minds of the beings we are talking about…

(58) Rosch (1978, p.28) argues that, implicit within any system of categorization, are the assumptions that: (a) the major purpose of any system of categorization is to reduce the randomness of the universe by providing "maximum information with the least cognitive effort", and (b) the real world is structured and systematic, rather than being arbitrary or unpredictable. Thus, if a particular way of categorizing information does, indeed, "provide maximum information with the least cognitive effort", *it can only do so because the structure of that particular system of categories corresponds with the perceived structure of the real world*.

The intentional stance also meets the criteria Dennett specified (1995, pp.50-51) for algorithms:

(1) *Substrate Neutrality*: It is a "mechanism" that produces results regardless of the material used to perform the procedure ("the power of the procedure is due to its *logical* structure, not the causal powers of the materials used in the instantiation").

(2) *Underlying Mindlessness*: Each constituent step, and each transition between each step, is so utterly simple, that they can be performed by a "dutiful idiot".

(3) *Guaranteed Results*: "Whatever it is that an algorithm does, it always does it, if it is executed without misstep. An algorithm is a foolproof recipe."

(59) Dahlbom (1999, pp.162-163), commenting on Dennett (1978b), remarks that:

> Dennett has a remedy for this neglect of knowledge as a social phenomenon] that unfortunately he has not been particularly interested in using. Distinguishing, in "*How to Change Your Mind*" [Dennett, 1978b] between "opinions" and "beliefs", between, roughly, "sentences held true" and "dispositions to behave", he has the distinction he needs to engage in a discussion of knowledge as a social phenomenon. But a naturalized philosophy does not have much to say about opinions. They seem to be peculiarly human, less functional, less biological, than beliefs. And beliefs are certainly important. With the wrong ones we die. But then, on the other hand, for most of us, thanks to evolution, the right ones come rather naturally. Most of our dispositions to behave are generally shared, tacit natural habits, not much to fuss about. Opinions, in contrast, are the medium of disagreement, argument, and explicit conflict. Opinions make a difference. Sentences held true are what human beings live and die for. They are what religion, politics, and science are made of, so how can you do epistemology without them?
>
> Dennett can, of course, be excused for not seriously including opinions as objects of study in his philosophy of mind, by the fact that doing so would force him out of his natural habitat, the human organism. The human organism was not designed for language, he will say. The underlying motive, here, seems to be rooted in an unfortunate divide between contemporary psychology and sociology. In psychology, people are organisms with beliefs, while in contemporary sociology they are persons with opinions. It is not easy to cross that divide.

(60) For more discussion of *akrasia* (“weakness of the will”), also known as “incontinence”, see Chan (1995), Rorty (1997), Sorensen (1997), Bovens (1999), Gilead (1999), Arpaly (2000), Jiang (2000), Peijnenburg (2000), and Smith (2001).

(61) Dennett’s distinction between “*belief*” and “*opinion*” seems difficult to match up with real world experience. In hypnotherapy, for example, it is essential to differentiate between two sorts of belief: (a) superficial, weakly-held, easily articulated, easily changed *views*, and (b) deeply held, *non-negotiable values* and *firm convictions* which are very difficult to articulate in any coherent way, and which appear to be almost impossible to change.

The principal reason being that whilst “views” generally come to the individual through some verbal process — and, thus, can be “suggested” away with hypnotic suggestion — “convictions” usually come through some other channel (generally embedded in something else). When using a telephone (with handset on the left), computer keyboard (with numerical key-pad on the right), microwave oven, etc. the embedded message is that right handed is O.K., left-handed is not. Embedded convictions and values *can’t be shifted* by “suggestion”; essentially because they were not implanted by verbal sequences. The only way to shift “values” and “convictions” is by experience; and the fact that the human mind really knows little difference between imagining something and something actually occurring means that “mental imagery” is the method of choice here. An example of the difference is that devoted Roman Catholics will repeatedly commit adultery (breaking a ‘the rule of god’ as listed in the 10 commandments), but will never get divorced (obeying a rule of the priests).

Perhaps Dennett is trying to prepare the ground for a statement something like “the true scientist lives in a world of opinions; and, in the pursuit of their craft, have learned to be immune from their beliefs”.

(62) Pilapil (1990), describes the case of a 3-year-old-boy with severe constipation because he refused to use the toilet after viewing a TV commercial “in which a toilet bowl was portrayed as turning into a monster, with the seat cover making a chomping movement” (p.592).

Phillips and his colleagues (Phillips, et al., 1992), having reviewed a reliable sample of 2,745,149 deaths, report that “women are more likely to die in the week following their birthdays than in any other week of the year. In addition the frequency of female deaths dips below normal just before the birthday… Thus, the birthday seems to function as a “lifeline” for some females. In contrast, male mortality peaks shortly before the birthday, suggesting that the birthday functions as a “deadline” for males” (p.532).

A different study (Phillips, et al., 2001) contrasted the “timing of death” of 209,908 Chinese and Japanese Americans with those of 47,328,762 white Americans. Chinese and Japanese (due to their use of the Chinese writing system) have various superstitions about certain numbers (Lee, 2001, describes this phenomenon in relation to mobile phone numbers) due to the fact that most of the numbers are pronounced in a way that is extremely suggestive of another word/character combination.

These are not homophones, such as “mite” and “might”, but words with very close, but different pronunciations — e.g., “the quin’s jelly” vs. “the quince jelly”; “one foot space” vs. “one foot’s pace”, etc. The Chinese/Japanese words for ‘**4**’ have a pronunciation in most dialects that is extremely close to those for ‘death’.

The study showed that, compared with the “white American” controls, whose daily death rate remained more or less constant — even on the 13th of the month [“there is no linguistic link in English between the number 13 and death”], (p.1445) — the Chinese/Japanese cardiac deaths not only peaked dramatically on the fourth of every month (roughly 50% increase on the daily average) but had no compensating dips either side of the fourth day of the month.

(63) The literature includes LeBon (1896); Basedow (1925); Seabrook (1929); Cannon (1957); Richter (1957); Sargant (1957); Chaplin (1959); Mathis (1964); Barker (1968); Kerckhoff and Back (1968); La Barre (1969); Engel (1971); Rigaud (1971); Lester (1972); Lewis and Lewis (1972); Clune (1973); Milton (1973); Lex (1974); Reed (1974); MacHovec (1976); Golden (1977); Eastwell (1982); Cawte (1983); Glascock (1983); Davis (1985); Engel (1992); and Wilson (1991).

(64) In terms of cancer, the second-most dangerous ritual is the "diagnostic ritual" — a ritual which permanently condemns the subject to a certain disease category (a way of thinking about an aspect of the subject's current physiological status that has a specific significance to the physician). The most dangerous ritual is the "prognostic ritual"; where the subject is exposed to an abstract statistical representation of the past collective behaviour of a group of people who used convent-ional treatment exclusively, and were diagnosed long ago, in entirely different circumstances. Milton (1973), writing from experience of treating more than 1,000 melanoma cases, warned of "diagnosis/prognosis" in terms of it being a "pointing the bone" ritual:

> there is a small group of patients in whom the realisation of impending death is a blow so terrible that they are quite unable to adjust to it, and they die rapidly before the malignancy seems to have developed enough to cause death. This problem of self-willed death is in some ways analogous to the death produced in primitive peoples by witchcraft ("pointing the bone"). (p.1435)

For example, in a melanoma clinic, the specific conditions of the "pointing the bone" ritual may be met in the following way:

(a) *transgression*: the subject is a pale-skinned red-head who continuously sunbathed;
(b) *acceptance*: she knows that excessive exposure to sunlight can cause melanoma;
(c) *awareness*: she hears the oncologist utter both his diagnosis and prognosis;
(d) *status*: the oncologist is a legally registered medical practitioner and, as well, has privileged access to endless mysterious technology; and
(e) *lethality*: she knows that melanoma has a very low survival rate.

(65) Unfortunately, most cancer patients who make any sort of attempt to "nullify the outcome" take the "more powerful witch-doctor" approach, and resort to miracle workers, religious healing and other superstitious practices.

In practice, however, the "expose the imposter" approach (which is, of course, also embedded in the "seek a second opinion" ritual) is the only one with any chance of success. Regardless of the accuracy of the physician's diagnosis, there is never any reason for the patient to accept his prognosis. There are a number of reasons for this, including:

(a) the prognosis is based on "survival rates" and the physician who says something like "The five year survival rate for condition **X** is 30%" usually forgets four things:

> (i) "5 year survival rates" (or 1, or 2, or 3, etc.) are a statistical measure used to calibrate the effectiveness of one regimen of treatment against another. This is done by recording how many of those treated (a) by regimen **A**, and (b) by regimen **B** are still alive after, in this case, 5 years have elapsed from their first diagnosis. If they found that the 5 year survival rate for regimen **A** was 23% and for regimen **B** was 47%, it *can* be said that regimen **B** is *twice as effective* as regimen **A**,
>
> (ii) what *can not* be said, yet often is, is that regimen **B** cures 47% (or that 53% die). The figures were created to compare two treatments; and, for example, no figures exist for 5 year surivival rates for those who have no treatment at all.
>
> (iii) the 47% means that 53 out of every 100 who was alive five years earlier is now dead. It does not mean that they were killed by the cancer; they might have been murdered, buried in an avalanche, got legionnaires disease, AIDS, meningitis, etc,).

(iv) the people concerned belong to a group that might have been aggregated some ten years earlier.

(b) the physician has never worked with anyone who has precisely the same physiological arrangement, life history, mental outlook, way of living and social circumstances;

(c) the prognosis has not been made on the basis of any special 'insider knowledge' of that specific individual person in his/her unique current or future circumstances.

(d) even the physician concerned will confirm that not every single person with that diagnosis dies (once that's established, you work to have them concentrate on becoming one of those who live, rather than one of those who die).

(66) Hans Reichenbach introduced these terms in the 1930s. Peijnenburg (1999) strongly argues that, to a considerable extent, Dennett has simplified, misunderstood and misrepresented Reichenbach's ideas. Consequently, I will concentrate on what Dennet seems to want to say (through *his* understanding of these terms), rather than allude to what Reichenbach actually said.

(67) Illata are "inferred things" (lit. "brought in" things), Peijnenburg (1999, p.68) remarks that, compared with abstraca, illata are real: they "have an existence on their own". The examples are taken from Peijnenburg (1999, p.65).

(68) Examples marked "**D**" and marked "**P**" are taken from Dennett (1987, p.53) and Peijnenburg (1999, p.66) respectively.

Abstracta are "*abstract things*" (lit. 'taken away from' things). Peijnenburg (1999, p.68) *remarking that "according to Reichenbach, nominalists and realists disagree with respect to the existence of abstracta: the former deny, and the latter assert that abstracta exist", has this to say about the existence of abstracta*:

> Consider again the term 'species of wallabies'. According to Reichenbach this term denotes an abstractum, but does this abstractum really exist? Reichenbach's answer here is a yes-and-no. On the one hand we may say that the species of wallabies exists, meaning that many wallabies exist and that they have certain biological qualities in common which distinguish them from other animals. On the other hand, we may also say that it does not exist, meaning that many wallabies exist and that any proposition containing the term 'the species of wallabies' can be translated into propositions concerning those wallabies. For Reichenbach the question whether or not abstracta exist is settled by a decision rather than being a matter of truth-character. The decision may be an affirmation, or a denial, or neither of them. For instance, of a family's furniture we probably will say that it exists, of the height of a mountain that it does not, and in the case of human society the decision will be somewhat indeterminate. But whatever its outcome, it remains a decision and thus a matter of convention . . .

(69) Dennett stresses the advantage of this approach:

> Intentional system theory deals just with the performance specifications of believers whilst remaining silent on how the systems are to be implemented. In fact this neutrality with regard to implementation is the most useful feature of intentional characterizations. (1987, p.59)

(70) It is also possible that precisely the same physical, structural arrangements will have different outcomes in different circumstances; for example, the adaptation that took place over thousands of years in people living in tropical Africa, that changed "the hemoglobin structure in a way that speeds the removal of infected cells from the circulation" (Nesse & Williams, 1996, pp.98-99) which provided "substantial protection from malaria" is also the arrangement responsible for the fatal condition known as *sickle-cell anaemia*.

(71) Dennett (1991, p.139) states that, by providing a different analysis of folk psychology (from, say, Fodor) in terms of his intentional stance, he has "insisted that far from being most perspicuously treated as (1) discrete, (2) semantically interpretable states (3) playing a causal role, the beliefs and desires of [folk-psychology] are best viewed as *abstracta*".

(72) Implicit within Dennett's intentional stance is a view that we can never achieve "Strong A.I.", and should stop searching for it. Even so, his intentional stance makes us recognize the extent to which being able to provide an explanation "in terms of meaningful states":

> …is efficient in prediction of behaviour. Further, it suggests that such explanation is the best we have for the purpose, at present, and indeed for the forseeable future. Prediction of human behaviour from the physical stance would require at least knowledge of brain processes far exceeding what is currently available in neuroscience. Similarly, prediction from the design stance would await at least major developments in cognitive science. In the meantime, we use folk psychology. But, furthermore, even supposing that neuroscience and cognitive psychology progressed to the point of being able, in principle, to predict behaviour as efficiently as explanation in terms of meaningful mental states, it would still be doubtful whether, for practical purposes of prediction, either could replace folk psychology. (Bolton & Hill, 1996, p.25)

(73) Boler (1968, especially pp.176-178) seems to have anticipated Clark's attribution of agencies to corporate entities.

(74) Clark argues (1994, p.406) that not only do corporations have the same legal status as human individuals (in that they can own property, enter contracts, etc.), but, in all cases, it is ultimately the corporation that acts (i.e., rather than the individual employee); in the same way that if I make a citizen's arrest, whilst my right hand actually grabs the crook, I am the "agent" of that arrest, not my right hand.

(75) Corporations make statements of official policy which, whilst accurately representing the beliefs of the corporate entity, may not represent the personal beliefs of any of the individuals involved. Moreover, according to Clark (1994, pp.406-7), these corporate statements often show the same sort of *referential opacity* as the beliefs of real people.

Referential opacity denotes lack of *transparency* in the referent of a word in a particular sentence. In *transparency*, a sentence remains true when another term, denoting the same referent, is substituted; in other words, the truth of a statement is not affected by the manner of referring to its object. For example [written in 2002], the sentence, "*The Leader of the Labor Party conceded the election*" remains true if "*Kim Beazley*" is substituted for "*The Leader of the Labor Party*". Yet, by contrast, the sentence "*The Leader of the Labor Party conceded the election*" does not necessarily remain true if either "*The Rhodes Scholar*" or "*A former Defence Minister*" is substituted for "*The Leader of the Labor Party*". Even though the two terms apply to the same individual, Kim Beazley was not conceding the election by virtue of his portfolio in a former government, or his academic history as a youth. Cases like this, where the manner in which a specific referent is denoted affects the truth of the statement, are termed "*referentially opaque*".

(76) Clark (1994, p.407), following Dennett, observes that whenever we attribute desires to a corporation, *that* attribution "serves [an] explanatory function". He also remarks that whilst corporate desires are "less volatile" than the desires of an individual person, "they do have a finite life span".

(77) As with humans, whilst there is no requirement that corporations *actually hold* the *beliefs* or *desires* — or *engage* in the sorts of *reasoning processes* — that are attributed to them, Clark (1994, pp.407-8) found that corporate actions/behaviour *could* be predicted, based on three factors: (a) the application of *practical reasoning* by the observer; (b) the attribution of a set of *beliefs* and *desires* to the corporation in question; and (c) a set of inferences about the sorts of action that an entity holding those *beliefs* and *desires* ought to perform.

(78) Speaking of "cognitive science", they loosely define "knowledge free" as being involved with things such as low level perception and language processing, motor control, the structure of memory stores, the limits of attention, the structure of concepts, etc.; they then argue that, using an analogy of a computer, these are essentially hardware issues. If we were to speak of Dennett's three stances, they are quite clearly speaking of his physical stance. They also make the point that if, at any time, "cognitive science" deals with any sort of psychological process, that particular process is modular and isolated from world knowledge and, moreover, "cognitive science" is generally concerned with the structural aspects of the mind — rather than the content of what the mind represents. They also assert that "cognitive science" has been "conspicuously unsuccessful" (p.311) in making any sort of explanation for the aspects of mental life relating to the every day, commonsense thought that is so knowledge-rich.

Although others (e.g., Morris & Richardson, 1995), disagree with the "rich"/"free" distinction, in their subsequent paper (1997) Chater and Pickering indicate that their subsequent position is far more one of "let's think about things this way" than "this is how it really is".

(79) Part of the dedication to Lorenzo de Medici at the beginning of Macchiavelli's *Prince* (Bondanella & Musa, 1979, p.78):

> And although I consider this work unworthy of your station, I am sure, nevertheless, that your humanity will move you to accept it, for there could not be a greater gift from me than to give you the means to be able, in a very brief time, to understand all that I, in many years and with many hardships and dangers, came to understand and to appreciate.
>
> I have neither decorated nor filled this work with fancy sentences, with rich and magnificent words, or with any other form of rhetorical or unnecessary ornamentation which many writers normally use in describing and enriching their subject matter; for I wished that nothing should set my work apart or make it pleasing except the variety of its material and the seriousness of its contents.
>
> Neither do I wish that it be thought presumptuous if a man of low and inferior station dares to debate and to regulate the rule of princes; for, just as those who paint landscapes place themselves in a low position on the plain in order to consider the nature of the mountains and the high places and place themselves high atop mountains in order to study the plains, in like manner, to know well the nature of the people one must be a prince, and to know well the nature of princes one must be of the people.

(80) It is also significant that whilst there is some evidence that some autistics seem to manifest a sort of "*Theory of Mind*" – and most researchers feel that these individuals have built some sort of 'translator' that allows them to mechanically predict a state of mind — the only time "mind-blindness" *does appear* is in autism (and its lesser subset Asperger's Syndrome).

By contrast*, it does not appear* in 'normal' people.

Similarly, although "mirror neurons" exist in 'normal people', they are absent in autistic people; there is a 100% match with autism and the absence of mirror neurons (once again mirror neurons were established for another purpose).

A further parallel is to Bipolar Disorder (formerly known as manic-depressive disorder) where it was established, by Australian John Cade that 100% of those with manic-depressive disorder had a lithium electrolyte deficiency in the brain. Treatment, which involves raising the levels of Lithium has shown, over time, that 80% of those whose Lithium levels were stabilized were symptom-free (in itself an amazing fact, because these 80% need no other pharmacological intervention other than that required to maintain their Lithium levels). Thus, here we have a circumstance where, although not all manic-depressives are symptom free when their Lithium levels are 'normal', every time an individual displays a low Lithium level, they display manic-depressive symptoms.

(81) Some of the research involved is Gallese, et al. (1996), Rizzolatti, et al. (1996), Gallese & Goldman, (1998), Rizzolatti & Arbib (1998), Arbib, et al. (2000), Brass, et al. (2000), Castelli, et al. (2000), Decety, et al. (2002), Fadiga, et al. (2001), and Umiltà, et al. (2001).

(82) See, for example, Motluk (2001) for a simple account. Perhaps the term "mirror neuron" was suggested by Locke (p.89):

> 24. In time, the mind comes to reflect on its own *operations* about the *ideas* got by *sensation*, and thereby stores itself with a new set of *ideas*, which I call *ideas* of *reflection*. These are the *impressions* that are made on our *senses* by outward objects that are extrinsical to the mind; and *its own operations*, proceeding from powers intrinsical and proper to itself, which, when reflected on by itself, become also objects of its contemplation, are, as I have said, *the original of all knowledge*. Thus the first capacity of human intellect is that the mind is fitted to receive the impressions made on it either through the i by outward objects, or by its own operations when it *reflects* on them. This is the first step a man makes towards the discovery of anything, and the ground-work whereon to build all those notions which ever he shall have naturally in this world. All those sublime thoughts which tower above the clouds, and reach as high as heaven itself, take their rise and footing here: in all that great extent wherein the mind wanders, in those remote speculations it may seem to be elevated with, it stirs not one jot beyond those *ideas* which *sense* or *reflection* have offered for its contemplation.
>
> 25. In this part the *understanding* is merely *passive*; and whether or no it will have these beginnings, and as it were, materials of knowledge, is not in its own power. For the objects of our senses do, many of them, obtrude their particular *ideas* upon our minds whether we will or no; and the operations of our minds will not let us be without, at least, some obscure notions of them. No man can be wholly ignorant of what he does when he thinks. These *simple ideas*, when offered to the mind, *the understanding can* no more refuse to have, nor alter when they are imprinted, nor blot them out and make new ones itself, than a mirror can refuse, alter, or obliterate the images or *ideas* which the objects set before it do therein produce. As the bodies that surround us do diversely affect our organs, the mind is forced to receive the impressions; and cannot avoid the perception of those *ideas* that are annexed to them.

(83) In their correction, Bradshaw and Mattingley (2001) emphasize the importance of the word "*suddenly*": "It was because he "received the message suddenly" that he felt it (the experience of hyperaesthesia)".

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